IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of: Herman-Joseph MENSING et al

Application No.: 09/667,713

Filed: September 22, 2000

For: MACHINE FOR PRODUCING A CORRUGATED CARDBOARD...

Confirmation No.: 9947

Art Unit: 1733

Examiner: G. Piazza

Washington, D.C.

Atty.'s Docket: MENSING=1

Date:

Mail Stop APPEAL BRIEF - PATENTS

THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Sir:

Transmitted herewith is a [X] BRIEF ON BEHALF OF APPELLANT in the above-identified application.

[ ] Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted

[ ] A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.

[XX] Fee for Filing a Brief in Support of an Appeal $320.00

The fee has been calculated as shown below:

	(Col. 1) CLAIMS REMAINING AFTER AMENDMENT		(Col. 2) HIGHEST NO. PREVIOUSLY PAID FOR	(Col. 3) PRESENT EXTRA EQUALS	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
TOTAL	*	MINUS	** 20	0	x 9	$		x 18	$
INDEP.	*	MINUS	*** 3	0	x 42	$		x 84	$
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM					+ 140	$		+ 280	$
					ADDITIONAL FEE TOTAL	$	OR	TOTAL	$

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.

** If the "Highest Number Previously Paid for" IN THIS SPACE is less than 20, write "20" in this space.

*** If the "Highest Number Previously Paid for" IN THIS SPACE is less than 3, write "3" in this space.

The "Highest Number Previously Paid For" (total or independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment of the number of claims originally filed.

[XX] Conditional Petition for Extension of Time

If any extension of time for a response is required, applicant requests that this be considered a petition therefor.

[XX] It is hereby petitioned for an extension of time in accordance with 37 CFR 1.136(a). The appropriate fee required by 37 CFR 1.17 is calculated as shown below:

Small Entity			Other Than Small Entity		
Response Filed Within			Response Filed Within		
[ ]	First	- $ 55.00	[XX]	First	- $ 110.00
[ ]	Second	- $ 205.00	[ ]	Second	- $ 410.00
[ ]	Third	- $ 465.00	[ ]	Third	- $ 930.00
[ ]	Fourth	- $ 725.00	[ ]	Fourth	- $ 1450.00
Month After Time Period Set			Month After Time Period Set		

[ ] Less fees ($_____) already paid for ___ month(s) extension of time on _____.

[XX] Credit Card Payment Form, PTO-2038, is attached, authorizing payment in the amount of $ 430.00.

[XX] The Commissioner is hereby authorized and requested to charge any additional fees which may be required in connection with this application or credit any overpayment to Deposit Account No. 02-4035. This authorization and request is not limited to payment of all fees associated with this communication, including any Extension of Time fee, not covered by check or specific authorization, but is also intended to include all fees for the presentation of extra claims under 37 CFR §1.16 and all patent processing fees under 37 CFR §1.17 throughout the prosecution of the case. This blanket authorization does not include patent issue fees under 37 CFR §1.18.

BROWDY AND NEIMARK

Attorneys for Applicant(s)

By: _____
Sheridan Neimark
Registration No. 20,520

Facsimile: (202) 737-3528
Telephone: (202) 628-5197

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Hermann-Joseph MENSING et al	)	Examiner: G. Piazza
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Appln. No.: 09/667,713	)	Washington, D.C.
	)	
Date Filed: September 22, 2000	)	July 2, 2003
	)	
For: MACHINE FOR PRODUCING A CORRUGATED CARDBOARD…	)	confirmation No.: 9947
	)	ATTY.'S DOCKET: MENSING=1

BRIEF ON BEHALF OF APPELLANTS

Mail Stop APPEAL BRIEF-PATENTS
Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The present Appeal is taken from the Action of the examiner in finally rejecting claims 1-20. A clean copy of these claims, double-spaced, appears in the appendix to this Brief.

REAL PARTY IN INTEREST

The real party in interest is BHS Corrugated Maschinen-und Anlagenbau GmbH, of Huttenwerkstrasse 1, D-92729 Weiherhammer, Germany.

RELATED APPEALS AND INTERFERENCES

To the knowledge of undersigned, there are no related appeals or interferences.

STATUS OF THE CLAIMS

All of the pending claims 1-20 are rejected.

STATUS OF AMENDMENTS

The Advisory Action mailed April 1, 2003, indicates that the amendments filed March 17, 2003, will be entered for purposes of Appeal. In this regard, the Advisory Action states as follows (top of page 2, continuation of paragraph 3):

> Applicant's reply has overcome the following rejection(s): 112 rejections in paragraph 6-8, Specification objection in paragraph 3, and most of the claim objections in paragraph 2 of the Prior Office Action, Paper no. 5.

Accordingly, appellants believe that the amendments filed March 17, 2003, have been entered, and are proceeding in reliance thereof.

As the examiner noted some still remaining informalities in claim 10, appellants filed on May 30, 2003, a still further amendment to dispose of such informalities. The Advisory Action mailed June 13, 2003, indicates entry of the amendment filed May 30, 2003, for purposes of Appeal.

SUMMARY OF INVENTION

A fundamental aspect of the present invention resides in a new and non-obvious system for measuring and controlling the thickness (hereinafter called the "width") of the **gap** between the glue applicating roller (the "glue roll") and the corrugating roller carrying the sheet to be glued in a system for producing corrugated cardboard (often referred to in the art as "paperboard") sheeting. More generally, the present invention relates to a system for adjusting and thus maintaining a consistent "width of the glue gap" between a corrugating roll and a glue roll in a corrugated cardboard machine. As stated at page 2, lines 16-18[1], the present invention provides a system "for producing corrugated cardboard in which the adjustment of the glue gap can be carried out in the simplest possible manner and automatically."

In general, and as pointed out commencing with the last line on page 3 with respect to the apparatus, and commencing on page 5, line 15 with respect to the method, the system of the present invention incorporates and utilizes "a calibration device for adjusting the width B of the glue gap having at least one contact-pressure unit for pressing a glue-roll bearing against the corresponding corrugating-roll

[1] Unless indicated otherwise, references hereinafter are to appellants' specification.

bearing with a contact-pressure force A, at least one force-measuring unit for measuring a force of the bearing contact pressure P between the pressed-on glue-roll bearing and the corresponding corrugating-roll bearing, and at least one adjusting unit for adjusting a bearing distance L between a pressed-on glue-roll bearing and the corresponding corrugating-roll bearing,…".

Key elements further involve the bearings for the glue roll and the corrugating roll. These are important because the forces measured in the present invention are the bearing contact pressure forces.

> The gist of the invention entails pushing the bearing of the glue roll against the bearing of the corrugating roll with a predetermined force, and measuring the force of the bearing contact pressure between the two bearings. The distance between both bearings is subsequently reduced until the glue roll comes into contact with the corrugating roll. This is detected because the force of the bearing contact pressure decreases, since a portion of the contact-pressure force is transferred via the rolls. (page 6, lines 7-13)

Looking next at the illustrated embodiment, in particular Fig. 2 thereof, and page 9 commencing with line 4, the calibration device 37 of the calibration system includes a contact-pressure unit 38 incorporating a piston with a piston rod 39 adapted to push, with a contact-pressure force A, against the bearing housing 26 at the respective ends of the

glue roll 22 in a direction toward the axis 7 of the corrugating roll 3, i.e. along the plane spanned by the axes 7 and 28 as best shown in Fig. 1. When the piston rod 39 is driven in the upward direction from the perspective shown in Fig. 2, i.e. driving the glue roll 22 toward the corrugating roll 3, force is applied against a force-measuring unit 41. This results in the control of an adjusting unit 42 which adjusts the bearing distance L (see Fig. 2) between the bearing housings 26, 26' at the ends of the glue roll 22, and the bearing housings 32, 32' at the ends of the corrugating roll 3.

In the illustrated embodiment, the adjusting unit 42 incorporates a wedge 43 (page 9, lines 12 et seq.)connected to the bearing housing 32, and a sliding wedge 44 which is movable parallel to the axes 28 and 7 of the respective rolls 28 and 3, the sliding wedge 44 being movable by a spindle motor 45 through a spindle 46. (The same structure appears at the opposite end as shown in Fig. 3.) Mounted on the ends of the bearing housings 26, 26' of the glue roll 22 are eddy current sensors 47, 47' for measuring the distance R between the bearing housings 26, 26' of the glue roll 22, and the surface of the corrugating roll 3.

Focusing on the end shown in Fig. 2, the eddy current sensor 47, the force-measuring unit 41, the spindle

motor 45, and the contact-pressure unit 38 are operatively connected to a control unit 49, which in turn controls the aforementioned contact-pressure unit 38 (page 9, lines 18-22).

How the aforementioned system operates is best described in appellants' specification starting at page 10, line 14. In an initial position there is a first gap which exists between the glue roll 22 and the corrugating roll 3, wherein neither the glue roll 22 nor the stop ring 36a[2] are in contact with the corrugating roll 3 (page 10, lines 18 and 19). At this initial point, the force of the bearing contact pressure P measured in the force measuring unit 41 essentially corresponds to the contact-pressure force A (page 10, lines 19-21). As the sliding wedge 44 is moved to the left (in the orientation of Fig. 2) by the spindle motor 45, the force A drives the bearing housing 26 of the glue roll 22 toward the bearing housing 33 of the corrugating roll 3 until the stop ring 36a comes in contact with the corrugating roll 3 (page 10, line 21 through page 11, line 1).

When this occurs, the contact-pressure force A branches out, i.e. a portion of the force A is transferred by the stop ring 36a to the corrugating roll, while another portion of the force A continues to be transferred by the bearing housing 26 and the force measuring unit 41 to the

[2] As indicated at page 12, lines 6-10, the stop rings 36a are not essential.

bearing housing 32 (page 11, lines 1-4). The force of the bearing contact pressure P measured by the force-measuring unit 41 thus decreases, resulting in the detection of the contact of the stop ring 36a with the corrugating roll 3 (page 11, lines 4-7). This results in calibration of the glue gap 30 (page 11, lines 10-12) so as to establish a reference value or base-line.

After such calibration is carried out, the glue roll 22 is then moved away from the corrugation roll 3. "The glue gap 30 that has been adjusted in the manner has a known width, which results from the width of the calibrated glue gap 30 and the height by which the glue roll 22 was lifted off. This height can be measured with the eddy current sensor 47. The glue gap 30 is adjusted such that its width corresponds to the thickness of the corrugated sheet 51 plus a pre-defined amount of slip, …. Changes in the gap width, which may occur, e.g., due to thermal expansion, are measured during the operation by the eddy current sensor 47 and automatically readjusted by the control unit 49 and the adjusting unit 42." (paragraph spanning pages 11 and 12)

ISSUES

It is understood from the Advisory Actions that all the formality issues have been resolved, taking into account the further amendment filed on May 30, 2003. That leaves the

rejections under §103 only, and appellants are proceeding in reliance of their understanding that the only remaining issues involve the rejections under §103.

There are three main types of rejections under §103, and there are accordingly three main issues, namely

(1) whether or not claims 1-12 and 15-20 would have been obvious to a person of ordinary skill in the art at the time the present invention was made from a consideration of Tokuno USP 4,319,947 (Tokuno) in view of Kanda USP 4,629,526 (Kanda) and Pallas et al EP 0870598A1, based on the English language Pallas equivalent USP 6,409,857 (Pallas),

(2) whether or not claims 8 and 15-20 would have been obvious to a person of ordinary skill in the art at the time the present invention was made from a consideration of Tokuno in view of Kanda and Pallas, and **optionally** further in view of Weber et al USP 2,641,220 (Weber), Rutkoskie et al USP 1,961,829 (Rutkoskie), Narang et al USP 5,336,319 (Narang), and/or Berthelot et al USP 4,549,924 (Berthelot)[3], and

[3] By appellants' rough calculation, this amounts to more than ten (10) different rejections taking into account the various permutations of the application or non-application of Weber, Rutkoski, Narang, and Berthelot either together or in any various combination. Appellants respectfully complain, for the record, that such a plurality of rejections and reliance on such a large number of references violates the spirit, and indeed the letter, of MPEP 706.02 which makes clear that prior art rejections should ordinarily be confined strictly to the best available art and that cumulative rejections should be avoided. The reliance on so many references and so many combinations and permutations creates not only a great burden on the appellants, but also on the PTO Board of Patent Appeals and Interferences.

(3) whether or not claims 13 and 14 would have been obvious to a person of ordinary skill in the art from a consideration of Tokuno in view of Kanda and Pallas, further in view of Williams USP 4,806,183 (Williams), Kohler et al USP 6,068,701 (Kohler) and/or Thorn USP 2,827,873 (Thorn)[4].

There are of course a number of sub-issues as well, including, *inter alia*,

whether or not the proposed combinations, if obvious, would result in the claimed subject matter;

whether or not the combinations as proposed would have been obvious to the person of ordinary skill in the art at the time the present invention was made, e.g. whether or not the citations provide any motive or incentive, reason or purpose, teaching or suggestion for their combination as proposed;

whether or not the examiner gave proper effect to the Declaration of record; and

whether or not appellants' improved results could have been predicted or foreseen from a consideration of the prior art, i.e. whether or not there would have been a reasonable expectation of obtaining appellants' results from a consideration of the citations in the various proposed combinations.

[4] Here we have seven (7) different combinations of four, five and six references in various combinations of quaternary citations.

Other sub-issues will become apparent from appellants' argument section appearing below.

GROUPINGS OF CLAIMS

Insofar as the first rejection is concerned, i.e. the rejection under §103 of claim 1-12 and 15-20, claim 2 may by considered along with claim 1; claims 6 and 7 may be considered along with claim 5; claim 15 may be considered along with claim 11; and claims 19 and 20 may be considered along with claim 18.

As regards the series of second rejections, namely the rejection of claims 8 and 15-20 as obvious from Tokuno in view of Kanda and Pallas and further optionally in view of any one or more of Weber, Rutkoski, Narang, and Berthelot, all of claims 15-20 can be considered along with claim 8.

As regards the third series of rejections of claims 13 and 14 based on Tokuno in view of Kanda and Pallas and further in view of one or more of Williams, Kohler and Thorn, claims 13 and 14 can be considered together.

Appellants make no admissions that any of the claims are or are not patentably distinct from one another.

ARGUMENT

Appellants respectfully submit that the examiners have not met their burden. The claimed invention would not

have been obvious to the person of ordinary skill in the art at the time the present invention was made, i.e. without recourse to appellants' disclosure, from any obvious combination of any of the references relied upon.

The errors in the rejections, what the individual citations disclose, and the features recited in appellants' claims which are not made obvious by the proposed combinations appear below. Because of the complexity of the claimed system, these are in part pointed out below first by individual analysis of each citation, explaining what appears in appellants' claims not shown by the individual citations.[5]

The Disclosure of the Cited Prior Art With Respect to the Claimed Subjects - Novelty

a) Tokuno (US 4 319 947 A)

Tokuno shows a machine for producing a corrugated cardboard sheet, incorporating a corrugated sheet and a liner sheet glued to the corrugation crests of the corrugated sheet. A lower rotatable corrugating roll 5 serves, together with another corrugating roll, to give the corrugated sheet its

[5] Appellants of course fully understand that there are no rejections under §102. Nevertheless, this approach is adopted for the present Brief as the best way of noting the features of the present invention not shown by the prior art.

shape. Of course such a corrugating roll has two opposite ends. A gluing device serves to apply glue onto the corrugation crests. The gluing device has a glue roll 6 rotating parallel to the corrugating roll 5. The glue roll 6 has two opposite ends.

Between the glue roll 6 and the corrugating roll 5 there is delimited a clearance A, i.e. a glue gap. Via a glue-roll moving unit 500, the glue roll is advanceable towards the corrugating roll 5 for adjusting the width of the glue gap. Together with a detection unit 100, the glue-roll moving unit 500 constitutes an adjustment device for adjusting the width of the glue gap, by which the distance between the glue roll 6 and the corrugating roll 5 can be adjusted. A control unit which is part of the adjustment device activates the glue-roll moving unit 500 in dependence of the value measured by the clearance detection unit 100.

Tokuno does not show (or make obvious) a corrugating roll with corrugating-roll ends having bearing journals mounted in respective corrugating-roll bearings.

Further, Tokuno does not show (or make obvious) a glue roll having glue-roll ends with bearing journals mounted in respective glue-roll bearings.

In addition, Tokuno does not show (or make obvious) glue-roll bearings corresponding to corrugating-roll bearings.

Tokuno further shows no calibration device for adjusting the glue gap. A calibration is a zero point adjustment giving a reference value or a base-line for subsequent adjustment steps. Such a calibration is not taught (or made obvious) by Tokuno.

A contact-pressure unit is not shown (or made obvious) by Tokuno.

A force-measuring unit also is not shown (or made obvious) by Tokuno.

Tokuno's clearance detection unit 100 measures a clearance between a receiving piece 101 secured to the machine frame and a sensor 103 mounted to a gluing device frame 15. This clearance is adjusted by Tokuno's adjusting device. Therefore, Tokuno does not show (or make obvious) an adjustment between a pressed-on glue bearing and a corresponding corrugating-roll bearing.

Further, Tokuno's disclosure lacks a control unit which activates an adjusting unit such that a distance between the glue roll and the corrugating roll is reduced until the force of the contact pressure decreases based on the glue roll and the corrugating roll coming into contact with one another.

All these features lacking in Tokuno are recited in claim 1.

Tokuno also does not show (or make obvious) a control unit being connected to a contact-pressure unit. Therefore, these additional features recited in the dependent portions of claims 2 and 15 are novel and unobvious from Tokuno.

Two contact-pressure units are not shown by Tokuno. Therefore, the dependent claim portions of claims 3 and 16 are novel and unobvious from Tokuno.

Two force-measuring units are not shown or made obvious by Tokuno. Therefore, the dependent claim portions of claims 4 and 17 are novel and unobvious from Tokuno.

Tokuno does not show or make obvious two adjusting units. Therefore, the dependent claim portions of claims 5 and 18 are novel and unobvious from Tokuno.

Claim 8 calls for all the features of claim 1. Therefore, claim 8 defines novel and unobvious subject matter over Tokuno for all the reasons mentioned above with respect to claim 1. In addition, Tokuno does not show or make obvious a glue roll comprising at least a stop ring having a larger outer diameter than the rest of the glue roll.

Tokuno shows a corrugating roll having a corrugated sheet being at least partly wrapped around the corrugating roll.

Claim 9 calls for the features of claim 1 plus the other features. Tokuno's disclosure lacks all the features mentioned above with respect to claim 1.

A reduction of the distance between the glue roll and the corrugating roll via the adjustment device until the force of the contact pressure between the glue roll and the corrugating roll decreases due to the glue roll and the corrugated sheet coming into contact with one another is not shown or taught by Tokuno. In this regard, it is respectfully noted that the requirement that an activation of an adjustment unit is to be done until a certain condition is fulfilled, provides a structural requirement for the adjustment unit.

Therefore, the respective feature in claim 9 stating that activation means are present activating the adjustment unit to reduce a bearing distance until the force of the bearing contact pressure decreases due to the glue roll and the corrugated sheet coming into contact with one another is a structural feature of the activation means as called for in claim 9.

Thus, the dependent claim portion of claim 9 also is novel and unobvious with respect to Tokuno.

Tokuno discloses a process for adjusting a machine for producing a corrugated cardboard sheet. In Tokuno's process, a machine is provided for producing a corrugated

cardboard as mentioned above. Initially, a clearance between the receiving piece 101 and the sensor 103 of the detection unit 100 is detected and adjusted.

During this operation of the Tokuno apparatus, no positioning of the glue roll in a starting position in which the glue roll is not in contact with the corrugating roll occurs or is taught by Tokuno.

Further, a reduction of the distance between the glue roll and the corrugating roll until the force of the contact pressure between these two rolls decreases due to a contact between the glue roll and the corrugating roll is also not described or made obvious by Tokuno.

Claim 10, which calls for a process utilizing the apparatus recited in claim 1, is novel and unobvious with respect to Tokuno.

Tokuno does not disclose or make obvious increasing the distance between the glue roll and the corrugating roll by a predetermined amount after these two rolls came into contact with each other during an adjustment displacement.

Claim 11 in addition calls for all of the features which are not shown in Tokuno's disclosure and which are mentioned with respect to claim 10 above. Therefore, claim 11 is novel and unobvious from Tokuno.

Increasing the bearing distance by an amount of 0.01 to 0.03 mm is not shown by Tokuno. Therefore, the added dependent claim portion of claim 12 is novel and unobvious from Tokuno.

Driving the corrugating roll and the glue roll at different circumferential speeds is not taught by Tokuno.

Therefore, the dependent portions of claims 13 and 14 are novel with respect to Tokuno, as is believed to be recognized by the PTO.

b) Kanda (US 4 629 526 A)

Kanda shows a machine for producing a corrugated cardboard sheet having a corrugated sheet and a liner sheet glued to the corrugation crests of the corrugated sheet. Kanda's machine comprises two corrugating rolls 22, 24 giving the corrugated sheet its shape. The opposite ends of the corrugating roll are mounted in respective corrugating-roll bearings 26, 28.

A gluing device for applying glue onto the corrugating crests comprises a glue roll being rotatable around an axis extending parallel to the corrugating-roll axis. A first contact-pressure unit 34 consisting of a lever 36, 38 and an actuator 42, 44, presses the two corrugating rolls together. A second contact-pressure unit consisting of

a lever 48, 52 and an actuator 54, 56 presses a press roll against the lower corrugating roll 24. The actuators 42, 44 and 54, 56 serve as adjusting units for adjusting the pressure force exerted on the respective rolls.

Kanda does not explicitly mention bearing journals being part of the corrugating-roll bearings.

How the glue-roll bearings are constituted is not disclosed by Kanda.

A glue gap between the glue roll and the corrugating roll is not mentioned by Kanda.

A width adjustment of the glue gap is not taught by Kanda. Also, Kanda does not show (or make obvious) a calibration device for adjusting a glue gap width.

Kanda's contact-pressure units do not press the glue roll against the corresponding corrugating roll.

Kanda does not show (or make obvious) a force-measuring unit.

Kanda's adjusting unit does not serve to adjust a distance between the glue roll and the corresponding corrugating roll. Instead, Kanda's adjusting unit adjusts pressure forces between the corrugating rolls (adjustment unit 34) and between the press roll and the lower corrugating roll (adjustment units 48 to 56).

A control unit connected to a force-measuring unit or to the adjusting unit is not shown (or made obvious) by Kanda.

Therefore, claim 1 is novel (and unobvious) from Kanda.

A control unit connected to the contact-pressure unit is not shown (or made obvious) by Kanda. Therefore, the dependent claim portions of claims 2 and 15 are novel and unobvious from Kanda.

Two contact-pressure units or two force-measuring units are not shown (or made obvious) by Kanda.

Therefore, the dependent claim portions of claims 3, 4 and 16, 17 are also novel (and unobvious) with respect to Kanda.

An adjusting unit having wedges is not taught by Kanda. Therefore, the dependent claim portions of claims 6, 7 and 19, 20 are novel (and unobvious) with respect to Kanda.

Kanda does not show (or made obvious) a glue roll with at least a stop ring having a larger outer diameter than that of the rest of the glue roll. Claim 8 in addition incorporates all the features which are not shown by Kanda and which are mentioned with respect to claim 1. Therefore, claim 8 is novel (and unobvious) with respect to Kanda.

An adjustment unit reducing a distance between the glue roll and the respective corrugating roll until the force of the contact pressure decreases due to these rolls coming into contact with one another is not taught by Kanda. Therefore, the dependent claim portion of claim 9 is novel (and unobvious) with respect to Kanda.

Kanda describes an adjustment process for adjusting the pressure between the two corrugating rolls and between a press roll and the lower corrugating roll. Kanda does not show (or make obvious) a calibration process with respect to the glue gap width. In fact, Kanda shows no calibration system at all.

A positioning of the glue roll in a starting position is not shown or taught by Kanda.

In addition, a reduction of the distance between the glue roll and the lower corrugating roll until the force of a contact pressure between these rolls decreases due to a contact between these rolls is also not shown or taught by Kanda.

Also, claim 10 recites all the features which are not shown by Kanda and which are mentioned above with respect to claim 1. Therefore, claim 10 is novel (and unobvious) from Kanda.

Claim 11 recites all features which are not shown by Kanda and which are mentioned with respect to claim 10 above. In addition, Kanda does not describe a subsequent increase of the distance between a glue roll and a corrugating roll after the distance between these rolls was decreased such that these rolls came into contact with each other. Therefore, claim 11 is novel and unobvious from with respect to Kanda.

Increasing the distance between the glue roll and the corrugating roll by an amount of 0.01 to 0.03 mm is not taught by Kanda. Therefore, the dependent portion of claim 12 is also novel (and unobvious) from Kanda.

Driving the corrugating roll and the glue roll at different circumferential speeds is not disclosed or taught by Kanda. Therefore, these features of claims 13 and 14 as recited in the dependent portions thereof are also novel (and unobvious) from Kanda.

c) Pallas (US 6 409 857 B2)

The disclosure in this reference corresponds to that of EP 0 870 598 A1 published previous to the filing date of the present application.

Pallas describes a machine for producing a corrugated cardboard sheet comprising a corrugated sheet with a liner sheet glued to the corrugation crests of the

corrugated sheet. Two rotatable corrugating rolls 11, 13 serve to give the corrugated sheet its shape. A gluing device 27 serves to apply glue onto the corrugation crests by a glue roll 45. The glue roll is rotatable around an axis extending parallel to the corrugating-roll axis. Between the glue roll and the corrugating roll, a glue gap is delimited. The glue roll is advanceable towards the corrugating roll via an actuator 53. This actuator 53 serves as contact-pressure unit for pressing the glue roll against the corresponding lower corrugating roll with a contact-pressure force.

Two force-measuring units 75a, 91a measure a force relating to the contact pressure between the pressed-on glue roll and the corresponding corrugating roll. The pressure force between the glue roll and the corrugating roll can be adjusted via a regulation valve 67a for the actuator 53a and via displacement of a stop 81a via a motor 87a. The stop 81a limits the amount of displacement of the glue roll via the actuator 53a. A control unit 69a is connected to the force-measuring units 75a, 91a and to the adjusting units 67a, 87a. With the help of the control unit 69a, the distance between the glue roll 45a and the lower corrugating roll 13a can be reduced.

Details regarding the corrugating-roll bearings or the glue-roll bearings are not shown by Pallas.

Pallas teaches a pressure adjusting device to adjust the pressure between the glue roll 45a and the lower corrugating roll 13a. No adjustment of a glue gap to a certain width is taught by Pallas. On the contrary, the Pallas machine for producing a corrugated cardboard is always operated so that **the glue gap width remains undetermined.** Only the pressure between the glue roll and the corrugating roll is controlled.

Pallas teaches no calibration at all. Furthermore, calibration of the glue gap width is not shown by Pallas.

Pallas' contact-pressure unit presses, via a glue wagon 51, the glue roll 45a against the lower corrugating roll 13a. Pressing a glue-roll bearing against the corresponding corrugating-roll bearing is not shown by Pallas.

Measuring a bearing contact pressure between the pressed-on glue-roll bearing and the corresponding corrugating-roll bearing also is not shown by Pallas. Moreover, Pallas' force-measuring units serve to measure the force the actuator 53 exerts on the glue wagon 51 (force-measuring unit 75) and the force the stop 79a mounted on the glue wagon 51a exerts on a stop cam 81a (force-measuring unit 91a). The forces measured by Pallas are not the bearing contact pressure forces, as in the present invention.

Pallas' adjusting unit serves to adjust a pressure force between the glue roll 45a and the lower corrugating roll 13a. Adjustment of the distance between these two rolls via an adjusting unit is not taught by Pallas.

A control unit activating an adjusting unit to reduce the distance between the glue roll and a corrugating roll, until the force of the contact pressure between these rolls decreases, is not taught by Pallas. Instead, in a first version of the Pallas device, the control unit 69 activates the actuator 53 until a certain contact pressure threshold between the glue roll 47 and the lower corrugating roll 13 is exceeded.

In a second version of the Pallas device, the contact pressure between the glue roll 47a and the corrugating roll 13a is measured as a difference between the output of the two force-measuring units 75a and 91a. Like in the first version, the actuator 53a is activated by the control unit 79a until the pressure between the glue roll 47 and the lower corrugating roll 13a increases to a given pressure value. Terminating the activation of the actuator 53a dependent on a decrease of a contact pressure between the glue roll and the corrugating roll is not disclosed by Pallas. Therefore, claim 1 is novel (and unobvious) over Pallas.

Claim 2 depends on claim 1 being novel with respect to Pallas. Therefore, claim 2 also is novel (and unobvious) from Pallas.

Pallas shows only one contact-pressure unit, i.e. the actuator 53a. Therefore, two contact-pressure units are not shown by Pallas. Therefore, the dependent claim portions of claims 3 and 16 are novel (and unobvious) from Pallas.

An adjusting unit having wedges is not shown by Pallas. Therefore, the dependent claim portions of claims 6, 7 and 19, 20 are novel (and unobvious) from Pallas.

A glue roll comprising a stop ring having a larger outer diameter than the rest of the glue roll is not shown by Pallas. Claim 8 recites all the features not shown by Pallas which are mentioned above with respect to claim 1. Therefore, claim 8 is novel (and unobvious) from Pallas.

A corrugated sheet is provided in the Pallas device partially wrapped around the corrugating rolls. To adjust the pressure between the glue roll and the corrugating roll, the actuator 53a is activated. A termination of this activation depending on a decrease of the force of the contact pressure between the glue roll and the corrugating roll due to the glue roll and the corrugated sheet coming into contact with one another is not taught by Pallas. In the Pallas device, this

termination depends on an increase of the contact pressure. Therefore, the dependent claim portion of claim '9 is novel (and unobvious) from Pallas.

Pallas describes a process for adjusting the pressure force between the glue roll and the lower corrugating roll. A pressure calibration process is not disclosed by Pallas. In fact, Pallas, like the other citations, teaches no calibration at all.

The reduction of the distance between the glue roll and the corrugating roll terminated by a decrease of the pressure force between these two rolls is not shown or taught by Pallas.

Further, claim 10 in addition recites all the features not disclosed by Pallas and mentioned above with respect to claim 1.

Therefore, claim 10 is novel (and unobvious) with respect to Pallas.

After contact between the glue roll and the corrugating roll during the pressure adjustment process of Pallas, no subsequent increase of the distance between these rolls during this adjustment is described (or made obvious) by Pallas. It should be noted that this subsequent increase of the distance between the glue roll and the corrugating roll is

part of the calibrating process called for in claim 11. Further, claim 11 recites all the features which are not present in Pallas' disclosure and mentioned with respect to claim 10 above. Therefore, claim 11 is novel (and unobvious) with respect to Pallas.

Increasing the distance between the two rolls by an amount of 0.01 to 0.03 mm is not taught by Pallas. Therefore, the dependent claim portion of claim 12 is novel (and unobvious)with respect to Pallas.

d) Weber (US 2 641 220 A)

Weber, applied against claims 8 and 15-20, discloses an apparatus for applying paste to moving work. A machine for producing corrugated cardboard sheet is not mentioned by Weber. A paste applicator roller 10 has end rings 22 having a larger outer diameter than the rest of the applicator roll 10. These end rings, which serve to reduce paste leakage during application of the paste via the applicator roll, have nothing to do with the present invention.

Weber shows no corrugating roll.

Further, Weber's applicator roll 10 is not a glue roll as stipulated in claim 1. The applicator roll of Weber applies paste to the moving work **via an intermediate transfer roll.** On the contrary, the glue roll according to claim 1

applies glue directly on the corrugation crests of the corrugation sheet. The **transfer roll** of Weber, i.e. the roll which actually applies the paste, **has no stop rings.**

A calibration device as stipulated in claim 1 is not taught by Weber.

Weber does not show a contact-pressure unit.

Weber's disclosure lacks a force-measuring unit.

An adjusting unit for adjusting the distance between the applicator roll or the transfer roll and a drum carrying the work is not shown by Weber.

Weber does not show a control unit as stipulated in claim 1.

Thus, claim 1 is novel and unobvious with respect to Weber.

Weber also clearly does not show the features of claims 2 to 20.

As to claim 8, Weber does not show a glue roll having stop rings. The roll of Weber's device having a function which corresponds to that of a glue roll of the present application is the transfer roll 4. This transfer roll has no stop rings as called for in claim 8.

Therefore, also claims 2 to 20 and particularly claims 8 and 15-20 are novel and unobvious with respect to Weber.

e) Rutkoskie (USP 1 961 829 A)

Rutkoskie, also applied against claims 8 and 15-20, shows a printing press with automatic feed. A machine producing a corrugated cardboard or a process for calibrating a machine for producing a corrugated cardboard sheet are not shown by Rutkoskie. Certain printing rolls of Rutkoskie's device may be heated via central heating elements 36. These are inserted into the rolls via outer mounting collars 30, 31. These collars 30, 31 have an outer diameter which is the same as that of the respective roll. Therefore, Rutkoskie shows no stop rings as stipulated in claim 8.

Therefore, claims 1 to 20 and particularly claims 8 and 15-20 are novel and unobvious with respect to Rutkoskie.

f) Narang (US 5 336 319 A)

Narang, applied against claims 8 and 15-20, shows an apparatus for coating a planar substrate with an adhesive layer. Narang neither shows a machine for producing a corrugated cardboard sheet nor a process for calibrating a machine for producing a corrugated cardboard sheet.

A suction sleeve 22 with a cylindrical outer surface serves to transport a disc 14 containing an adhesive layer. The sleeve 22 is driven by a belt 34 being guided by a drive pulley 47. A drive pulley is not a stop ring.

Therefore, claims 1 to 20 and particularly claims 8 and 15-20 are novel and unobvious with respect to Narang.

g) Berthelot (US 4 449 924 A)

Berthelot, also applied against claims 8 and 15-20, shows a gluing device for use in a machine for producing a corrugated cardboard sheet. A doctor roll 1 of this gluing device carries two end sleeves 2 having an outer diameter which is larger than that of the rest of the doctor roll 1. The doctor roll 1 contacts a glue roll 5 via the sleeves 2. The width between the doctor roll 1 and the glue roll 5 is controlled via the wall thickness of the sleeve, which may be circumferentially variable.

Neither a calibration device nor a calibration process as stipulated in claims 1 to 20 is shown or taught by Berthelot.

As to the sleeves 2, these are not parts of the glue roll, but parts of the doctor roll.

Therefore, claims 1 to 20 and particularly claims 8 and 15-20 are novel and unobvious with respect to Berthelot.

h) Williams (US 4 806 183 A)

Williams, applied against claims 13 and 14, discloses a machine for producing a multi-layer corrugated cardboard sheet. To the corrugation crests of the single facers 22, 24, glue is applied by a gluing device 42 comprising a plurality of glue rolls 36 and of weight rolls 40 corresponding to each single-faced sheet. Between the glue roll and a respective weight roll, a glue gap is defined. The glue gap width is adjusted by an adjustment device shown in Fig. 2.

A gap sensor 74 mounted on a frame part carrying the weight roll 40 measures the distance between it and a target 76 mounted fixed to the frame part of the glue roll. A control unit 32 is part of the adjusting device and holds the glue gap at a desired width. The weight roll 40 and the respective glue roll 38 are rotationally driven at different circumferential speeds.

Williams does not describe how the corrugated sheets of the multi-layer cardboard sheet are produced. No corrugating rolls are disclosed by Williams.

Williams' glue gaps are not defined between a glue roll and a corrugating roll, but instead between a glue roll and a weight roll.

A calibration device or a calibration process are not shown or taught by Williams.

Williams does not show or in any way make obvious a contact-pressure unit.

No force-measuring unit is either shown or taught by Williams.

Positioning of the glue roll in a starting position in which the glue roll is not in contact with the corrugating roll is not shown by Williams. Reducing the gap width between the weight roll 40 and the glue roll 38 until those rolls come into contact with each other is not taught by Williams.

Williams teaches weight rolls and corresponding glue rolls rotationally driven at different circumferential speeds, but does not show a corrugating roll being driven at different circumferential speed as compared to a respective glue roll.

Therefore, claims 1 to 20 and in particular the dependent parts of claims 13 and 14 are novel with respect to Williams.

i) Kohler (US 6 068 701 A)

Kohler, applied against claims 13 and 14, discloses a machine for producing a corrugated cardboard sheet with a corrugated sheet 18 lying between two liner sheets 16, 22. How the corrugated sheet is glued to the first liner sheet is not disclosed by Kohler. Only details with respect to the

application of glue to a previously produced single-faced corrugated sheet for the subsequent attachment of the second liner sheet are shown.

In the part of the machine producing a corrugated cardboard sheet disclosed by Kohler, no corrugating roll is present. Kohler's gluing device 38 comprises a glue roll 48 having glue-roll bearing journals 60 mounted in glue-roll bearings. Between the glue roll 48 and a rider roll 52, a glue gap 88 is delimited (Fig. 4). A "single-face" assembly 14 is guided over the rider roll such that the corrugation crests of this single face assembly 14 face the glue roll 48.

An adjusting device including a motor and a linear transducer in a closed loop system serves to adjust the glue gap width to a certain value. A contact-pressure unit 50 serves to press a glue-metering rod 48 onto the glue roll 48. The glue roll 48 and the rider roll 52 are driven at different circumferential speeds.

As mentioned above, Kohler does not show a corrugating roll.

Kohler's device does not have any type of force-measuring unit.

Kohler does not teach the reduction of a distance between the glue roll 48 and the rider roll 52 until these rolls come into contact with one another.

Kohler shows neither a calibration device nor a calibration process.

Kohler's contact-pressure unit does not press the glue roll 48 to the rider roll 52, i.e. the components defining the glue gap 88 are not pressed together via Kohler's contact-pressure unit.

Positioning the glue roll in a starting position in which the glue roll is not in contact with the corrugating roll is not taught by Kohler.

A subsequent increase of the glue gap width after a contact between the glue roll 48 and the rider roll 52 is not taught by Kohler.

Kohler discloses a glue roll and a rider roll being rotationally driven at different circumferential speeds, but does not show a glue roll and a corrugating roll rotating at different circumferential speeds.

Therefore, claims 1 to 20, in particular the dependent parts of claims 13 and 14, are novel with respect to Kohler.

j) Thorn (US 2 827 873 A)

Thorn, also applied only against claims 13 and 14, shows a device for gluing a single-faced cardboard sheet 1 to a second liner sheet 2. A glue roll 6 applies glue to corrugation crests of the single-faced corrugated sheet 1. To

this end, sheet 1 passes between the glue roll 6 and a guide roll 5. The guide roll 5 and the glue roll 6 are rotationally driven at different circumferential speeds.

The device as disclosed by Thorn shows no corrugating roll.

Thorn teaches neither a calibration device nor a calibration process.

Thorn does not show a contact-pressure unit for pressing the glue roll 6 against another roll.

An adjustment of a glue gap width is not taught by Thorn.

Thorn does not describe or teach any force-measuring unit.

Positioning the glue roll in a starting position in which it is not in contact with the guide roll 5 is not shown or taught by Thorn.

Neither a reduction of the distance between the guide roll 5 and the glue roll 6 until those rolls come into contact with one another, nor a subsequent increase of the distance between the guide roll and the glue roll is disclosed by Thorn.

Thorn teaches a guide roll and a glue roll being rotationally driven at different circumferential speeds, but

does not disclose a **corrugating** roll having a different circumferential speed as compared to the glue roll.

Therefore, claims 1 to 20 (and in particular the dependent parts of claims 13, 14 against which Thorn is applied) are novel and unobvious with respect to Thorn.

Non-obviousness of the Subject Matter of the Claims

A proper control of the glue application while producing a corrugated cardboard sheet is essential for the quality of the end product. This essential dependency of the corrugated cardboard sheet quality on the glue application control is mentioned for example in Pallas. The cited prior art dealing with glue application control relies on the following **different** control mechanisms:

(A) Controlling the glue gap width. This general type of control mechanism is taught for example by Tokuno, by Williams and by Kohler.

The control of the glue gap width has certain limitations which were not overcome by prior art. At first, the problem arises where the gap width should be measured. Tokuno, and as another example Williams, measure the gap width not directly between the glue roll and the roll carrying the sheet to be glued, but instead try to measure the width of the gap between sensor components mounted on the glue roll and on the corresponding carrier roll. Such an indirect measurement

is susceptible to measurement errors. The real glue gap may be different from that measured by such an indirect distance measurement.

Further, the glue gap width may change due to mechanical or thermal drifts during the production process. These drifts may affect the real glue gap differently than the distance between the indirect distance measuring components. This also leads to erroneous measurements of the glue gap width. No hint is given by the cited prior art how to overcome these disadvantages.

(B) Controlling the contact **pressure** between the glue roll and the corrugating roll.

This approach is used and taught by Pallas. As the pressure force between the glue roll and the corrugating roll can be directly measured, this leads to a direct control of the glue application parameters.

A drawback of this approach is that pressure control gives no information about the real glue gap width. Due to a variety of process parameters, e.g. the viscosity of the glue or the amount of glue present on the glue roll, the temperature of the glue, the temperature of the glue roll, the consistency of the corrugated cardboard sheet to be glued etc., identical pressure forces may occur while in fact the real glue gap width varies. This is very unsatisfactory as,

due to the fact that the real glue gap width affects the glue pattern on the corrugation crests of the corrugated sheet, the glue gap width has to be preserved irrespective of pressure variations. Due to this problem, glue gap width control (A) is favored compared to a glue gap pressure control (B) in the prior art, even though it has the aforementioned disadvantages.

The claimed invention overcomes the disadvantages of both approaches by combining aspects of these fundamentally different approaches in a calibration device and a corresponding process. This calibration gives a defined zero point or base-line for the glue gap width which subsequently can be utilized during glue gap adjustment. The calibration according to the invention is based on the fact that the pressure force between the glue-roll bearings and the corrugating-roll bearings which occurs during movement of the glue roll towards the corrugating roll decreases when the glue roll comes into contact with the corrugating roll. This decrease originates from the additional force path emerging after contact of these rolls. Contact between these rolls can be performed such that it is not influenced by the glue or by the corrugated sheet. Therefore, a precise zero point measurement, e.g. distance "0" between the glue roll and the

corrugating roll, is possible and is achieved according to the present invention.

No hint is given to such a calibration device or to such a calibration process in the prior art.

a) Non-Obviousness of the Claims Over Tokuno in View of Kanda

First, both Tokuno and Kanda have no points of identity regarding glue gap width adjustment. The object of Kanda's development is to provide a machine for producing a corrugated cardboard with a replaceable frame unit carrying the upper and the lower corrugating roll. Glue gap width control and/or calibration is not taught by Kanda at all. Therefore, the person of ordinary skill in the art, trying to improve Tokuno's device, would not take Kanda into account as Kanda does not suggest any solution or even discuss the problem. There is no motive or incentive for the proposed combination outside of appellants' specification.

However, even if the skilled artisan were to attempt to combine these diverse citations, the resultant combination of Tokuno and Kanda would not lead to the present invention:

Neither Tokuno nor Kanda show corrugating-roll ends with bearing journals. Neither Tokuno nor Kanda show glue-roll bearings.

Neither Tokuno nor Kanda show a calibration device or process. Tokuno shows a gap width adjustment without dealing with the problems of mechanical and thermal drifts and therefore gives no hint as to a required calibration. Kanda fails to deal with glue gap control at all. The glue gap width or the contact pressure between the glue roll and the corrugating roll are not affected by Kanda's device.

Kanda's contact-pressure units serve to press the upper corrugating roll to the lower one and to press a press roll to the lower corrugating roll. Neither Tokuno, which does not teach a contact-pressure unit at all, nor Kanda give a hint as to the claimed contact-pressure unit for pressing the glue roll against the corrugating roll. It is noted that this purpose of the contact-pressure unit as stipulated in claim 1 provides a structural recitation of the contact-pressure unit. Without a corresponding hint, the skilled artisan would not have equipped a glue roll with a contact-pressure unit.

Neither Tokuno nor Kanda give a hint as to a force-measuring unit.

Adjusting a bearing distance between the glue roll and the corrugating roll is taught by neither Tokuno nor Kanda.

Reducing the distance between the glue roll and the corrugating roll depending on the contact pressure between those rolls is taught neither by Tokuno nor by Kanda.

As neither reference shows these features, their combination (even if obvious) would not provide such feature.

Therefore, claim 1 would not have been obvious from Tokuno in view of Kanda.

A control unit connected to the contact-pressure unit is taught neither by Tokuno nor by Kanda. Therefore, even the dependent portion of claim 2 is not obvious from Tokuno in view of Kanda.

Neither Tokuno nor Kanda show two contact-pressure units. Therefore, even the dependent portion of claim 3 is not obvious from Tokuno in view of Kanda.

Neither Tokuno nor Kanda show two force-measuring units. Therefore, even the dependent portion of claim 4 is not obvious from Tokuno in view of Kanda.

Kanda shows two adjusting units but does not give a hint to incorporate these in a calibration device. Therefore, even the dependent portion of claim 5 is not obvious from Tokuno in view of Kanda.

Claims 6 and 7 are not obvious from Tokuno in view of Kanda as these claims depend from and incorporate claim 5.

Neither Tokuno nor Kanda show a glue roll equipped with a stop ring. In combination with the claimed embodiment of the control unit such that the distance between the glue roll and the corrugating roll is reduced depending on the pressure force between these rolls, this stop ring clearly has the purpose of giving a defined contact area between the glue roll and the corrugating roll. This feature therefore is not independent or separate from other features of an embodiment of the claimed machine, and gives a structural feature to the claimed calibration device.

As neither Tokuno nor Kanda give a hint as to such a stop ring, claim 8 is not obvious from Tokuno in view of Kanda.

Activation means arranged such that the reduction of the distance between the glue roll and the corrugating roll takes place until the contact pressure between the bearings of these two rolls decreases is neither taught by Tokuno nor by Kanda. Such an arrangement of the activation means necessarily requires a signal transfer between a contact pressure measuring unit and the activation means so that the activation means stop the distance reduction when the pressure

decrease occurs. No hint is given by Tokuno or Kanda to such an arrangement of an adjusting unit.

Therefore, claim 9 is not obvious from Tokuno in view of Kanda.

As mentioned above, neither Tokuno nor Kanda teach a calibrating process. A pure adjustment of a certain parameter is not a calibration, as an adjustment does not necessarily require a zero point or base-line measurement. If any calibration takes place with respect to the machines disclosed by Tokuno or Kanda (again, none is disclosed), it is not described how this is done[6].

No hint is given by Tokuno or Kanda to perform a calibration process using the components of a machine for producing a corrugated cardboard sheet.

Further, positioning of the glue roll in a starting position in which the glue roll is not in contact with the corrugating roll is taught neither by Tokuno nor by Kanda.

In addition, a reduction of a bearing distance between the glue roll and the corrugating roll depending on a bearing contact pressure is taught neither by Tokuno nor by Kanda.

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[6] Calibration devices or processes may take place in a totally different fashion without using structural components of the machines as calibrating element. For instance, calibration can take place by using a splicing tape as is described in the introduction of the specification of the present application. But this is not appellants' invention.

Therefore, claim 10 is not obvious from Tokuno in view of Kanda.

In addition to the features of claim 10, in claim 11 a subsequent increase of the distance between the glue roll and the corrugating roll after contact of these rolls is stipulated. Neither Tokuno nor Kanda give a hint as to such an increase. Such an increase provides the ability to adjust a desired glue gap width value after the zero point detection.

Therefore, claim 11 is not obvious from Tokuno in view of Kanda.

Neither Tokuno nor Kanda teach an increase of the bearing distance by an amount of 0.01 to 0.03 mm. Such an increase leads to a corresponding glue gap width which in most cases gives a desired glue pattern on the corrugated sheet. No hint is given to this advantageous range of values by Tokuno or Kanda.

Therefore, claim 12 is not obvious from Tokuno in view of Kanda.

Neither Tokuno nor Kanda teach driving the corrugating roll and the glue roll at different circumferential speeds. Therefore, claims 13 and 14 are not obvious from Tokuno in view of Kanda, and this is accepted by the examiners.

The dependent portions of claims 15 to 18 depending on claim 8 recite the features of the dependent portions of claims 2 to 5. As mentioned above, no hint is given as to these features by Tokuno or Kanda. Therefore, claims 15 to 18 are not obvious from Tokuno in view of Kanda.

b) Non-Obviousness Over Tokuno in View of Pallas

Despite of the fact that Tokuno and Pallas both deal with the control of a glue gap, these references have only a very limited relationship to one another in that respect, as they disclose and teach entirely different and unrelated mechanisms as pointed out above. Tokuno solely relies on width control, whereas Pallas solely relies on pressure control. The glue gap width variation control mentioned by Pallas has nothing to do with a glue gap width control. The skilled artisan would have had no reason or purpose to try to combine two references which address a problem using two entirely different approaches, and the proposed combination would not have been obvious.

Glue gap width variation is mentioned by Pallas regarding certain vibrations and/or resonant effects of the Pallas device. These effects all are met with the help of the Pallas pressure control. In that respect, Pallas states (column 4, lines 29 to 32):

> The [Pallas] invention moves away from the conventional view that a preset space must be left between the wave peaks of the corrugated sheet and the outer surface of the gluing roller.

Therefore, Pallas does not refer or relate to glue gap width control.

Due to this, the skilled artisan trying to improve Tokuno's device would not take into account Pallas as this latter reference obviously shows a technique which is incompatible with and antithetical to that of Tokuno.

Even if the skilled artisan were to tentatively try to combine the disclosures of Tokuno and Pallas, such a combination would not lead to the present invention. A combination of Tokuno and Pallas does not show the following features:

Neither Tokuno nor Pallas describe the bearing of the corrugating roll or of the glue roll.

Neither Tokuno nor Pallas describe a calibration device or a calibration process. In that respect, appellants respectfully refer above to the comments dealing with the definition and the purpose of a calibration. Regarding Pallas, such a calibration would mean calibration of the pressure force the glue roll should exert upon the corrugating roll. Neither such a calibration nor a calibration of a width is shown by Tokuno or Pallas.

Neither Tokuno nor Pallas show a contact-pressure unit pressing a glue-roll bearing against the corresponding corrugating-roll bearing. Tokuno shows no contact-pressure unit at all. Pallas shows a contact-pressure unit pressing a wagon 51 carrying a glue roll against the lower corrugating roll. The bearings are not pressed together, but the glue roll as a whole is pressed against the lower corrugating roll as a whole via the wagon 51.

Neither Tokuno nor Pallas show a force-measuring unit measuring a bearing contact pressure. Tokuno shows no force-measuring unit at all. The force-measuring units of Pallas serve to measure the force of a contact pressure between the glue-roll body and the lower corrugating-roll body. The contact pressure between the bearings of these rolls is not measured by the force-measuring units of Pallas.

Neither Tokuno nor Pallas show a distance adjustment between a glue-roll bearing and a corrugating-roll bearing. Pallas does not show a distance adjustment at all. The purpose of an adjustment is to hold the adjusted value at a desired level.

Regarding the glue gap width, this is not done by Pallas which relies on a contact pressure adjustment. Tokuno, on the other hand, shows no adjustment between the bearings of

the respective roll but between frame elements carrying sensor components of Tokuno's width sensor.

Neither Tokuno nor Pallas teach a reduction of the distance between the glue roll and the corrugating roll with a control unit arrangement such that this reduction takes place until the force of the bearing contact pressure decreases based on the glue roll and the corrugating roll coming into contact with one another. Such a decrease is measured via the force-measuring unit of the present invention as, at the time the rolls whose distance has been reduced come into contact with each other, an additional force path emerges via the two roll bodies. Therefore the force between the roll bearings decreases.

Regarding the embodiment of Fig. 3 of Pallas, the force between the glue roll-body 47a and the corrugating-roll body 13a is measured as a difference of the force measured via the force-measuring unit 75a between the actuator 53a and the wagon 51a, and the force measured via the force-measuring unit 91a between a stop 79a and its counterpart 81a. The desired contact pressure between the glue-roll body and the corrugating-roll body is reached in the Pallas device when this difference has increased to a certain level. The distance reduction between the glue roll 47a and the lower corrugating roll 13a of Pallas is not dependent on a decrease

of the pressure force between the glue-roll bearing and the corrugating-roll bearing. The second force transmittal path of Pallas via the stop 79a and its counterpart 81a serves to take a certain preload from the contact pressure between the glue roll 47a and the lower corrugating roll 13a. Such an adjustable preload has nothing in common with a glue gap width calibration according to claim 1.

Therefore, claim 1 is not obvious from Tokuno in view of Pallas.

Tokuno shows no contact-pressure units at all. Pallas shows only one contact-pressure unit, i.e. the actuator 53. Two contact-pressure units help to equalize the pressure forces exerted between the glue roll and the corrugating roll via the contact pressure units. No hint is given as to such an advantage by Tokuno or Pallas.

Therefore, claim 3 is not obvious from Tokuno in view of Pallas for this additional reason.

Pallas shows two force-measuring units but fails to teach those in combination with a calibration device. Tokuno shows no force-measuring units at all.

Therefore, claim 4 is not obvious from Tokuno in view of Pallas for this additional reason.

Neither Tokuno nor Pallas teach two adjusting units. Two adjusting units help to improve the alignment between the glue roll and the corrugating roll. Neither Tokuno nor Pallas give a hint as to such an advantage.

Therefore, claim 5 is not obvious from Tokuno in view of Pallas for this additional reason.

Neither Tokuno nor Pallas show a glue roll with a stop ring. The purpose and advantage of such a stop ring are referred to above. In addition, claim 8 recites all the features of claim 1.

Therefore, claim 8 is not obvious from Tokuno in view of Pallas.

Neither Tokuno nor Pallas show activation means arranged such that the distance between the glue roll and the corrugating roll is reduced until the contact pressure decreases due to these rolls coming into contact with one another. The force difference measured by the force-measuring unit 75a, and by the force-measuring unit 91a, does not decrease during the movement of the wagon 27a towards the lower corrugating roll 13a. Preloading with the help of the stop/counterstop arrangement 79a, 81a will result in limiting the pressure force between the glue roll 47a and the lower corrugating roll 13a to a certain value. This means that the

above mentioned force difference will rise from zero (no contact between the glue roll 47a and the lower corrugating roll 13a) to this predetermined value.

Neither Tokuno nor Pallas give a hint as to the utilization of a contact pressure decrease between the respective roll bearings as stipulated in claim 9. Therefore, claim 9 is not obvious from Tokuno in view of Pallas for this additional reason.

Neither Tokuno nor Pallas describe a calibration process. A reduction of the distance between the glue roll and the corrugating roll until the force of the bearing contact pressure decreases due to a contact between the glue roll and the corrugating roll is not taught by Tokuno or Pallas. Tokuno gives no hint as to this feature at all. Pallas describes reducing the distance between the glue roll 45a and the corrugating roll 13a and thereby increasing the contact pressure force between the glue roll 45a and the corrugating roll 13a until due to the adjusted preloading via the stop/counterstop arrangement 79a, 81a a certain contact pressure threshold is reached. No hint is given by Pallas to reduce the distance between the glue roll and the corrugating roll depending on a contact pressure decrease.

Therefore, claim 10 is not obvious from Tokuno in view of Pallas.

A subsequent increase of the distance between the glue roll and the corrugating roll after these rolls have come, during calibration into contact with each other is not taught by Tokuno or Pallas. None of these references incorporates such a concept of a gap width adjustment after a contact pressure calibration.

Therefore, claim 11 is not obvious from Tokuno in view of Pallas.

Neither Tokuno nor Pallas teach an increase of the bearing distance by an amount of 0.01 to 0.03 mm. Such an increase leads to a corresponding glue gap width which in most cases gives a desired glue pattern on the corrugated sheet. No hint is given to this advantageous range of values by Tokuno or Pallas.

Therefore, claim 12 is not obvious from Tokuno in view of Kanda for this additional reason.

The characterizing portions of claims 15 to 18 depending on claim 8 recite the features of the dependent portions of claims 2 to 5 as mentioned above, and no hint is given as to these features by Tokuno or Pallas. Therefore, claims 15 to 18 are not obvious from Tokuno in view of Pallas for these additional reasons.

c) Non-Obviousness Over Tokuno in View of Kanda and Pallas

As mentioned above, the skilled artisan would not combine either Tokuno and Kanda, or Tokuno and Pallas. A combination of all three references, i.e. Tokuno, Kanda and Pallas, therefore would be very highly implausible, and not obvious for the reasons given above. The gluing devices presented in these three references are very different from each other (especially Tokuno and Kanda are totally different from Pallas) and none of these references points to the direction of the gluing device of another one of these references, or is related thereto. Even if the skilled worker were to tentatively do so, also a combination of all three references would not result in the subject claimed in the present application:

Neither Tokuno nor Kanda nor Pallas show a corrugating roll with corrugating-roll bearing journals.

Further, neither Tokuno nor Kanda nor Pallas show glue-roll bearings.

Neither Tokuno nor Kanda nor Pallas describe a calibration device or a calibration method.

Neither Tokuno nor Kanda nor Pallas describe a contact-pressure unit being arranged to press a glue-roll bearing against a corrugating-roll bearing.

Neither Tokuno nor Kanda nor Pallas describe a force-measuring unit measuring a force of a bearing contact pressure between a glue-roll bearing and a corresponding corrugating-roll bearing.

Neither Tokuno nor Kanda nor Pallas show an adjusting unit arranged to the adjustment of the distance between a glue-roll bearing and a corresponding corrugating-roll bearing.

Neither Tokuno nor Kanda nor Pallas disclose a control unit arranged such that an activation to reduce the distance between a glue roll and a corrugating roll takes place depending upon a contact pressure decrease due to the contact between the glue roll and the corrugating roll.

Summing up, none of these three references deals with a calibration scheme according to the claimed invention. Tokuno and Pallas show adjustment schemes with no zero point detection regarding width with respect to Tokuno or pressure with respect to Pallas. Kanda fails to show the adjustment of a glue gap parameter at all.

Furthermore, no hint is given to the advantages of the calibration scheme which is the subject of claim 1 of the present application. In that respect, appellants' comments above regarding the non-obviousness of claim 1 over a

combination of Tokuno and Kanda and over a combination of Tokuno and Pallas are respectfully repeated by reference.

Therefore, claim 1 is not obvious from Tokuno in view of Kanda and Pallas.

Claim 2 depends on claim 1. Therefore, claim 2 is not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas show two contact-pressure units. Therefore, claim 3 is not obvious from Tokuno in view of Kanda and Pallas.

Pallas describes force-measuring units, but not with respect to a calibration device. Tokuno and Kanda show no force-measuring unit at all. Therefore, claim 4 is not obvious from Tokuno in view of Kanda and Pallas.

Kanda and Pallas show adjusting units but not with regard to a calibration device. Tokuno fails to show two adjusting units. Therefore, claim 5 is not obvious from Tokuno in view of Kanda and Pallas.

Claims 6, 7 depend on claim 5. Therefore, these claims are not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas show a glue roll with a stop ring. In addition claim 8 recites all the

features of claim 1 above. Therefore, claim 8 is not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas show an arrangement of activation means such that the distance between the glue roll and the corrugating roll is reduced until a contact pressure force decreases due to the contact between the glue roll and the corrugating roll. Therefore, claim 9 is not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas deal with a calibrating process. Further, the process of claim 10 includes a provision step reciting all the features of claim 1 above.

In addition, neither Tokuno nor Kanda nor Pallas teach a reduction of the distance between the glue roll and the corrugating roll until the decrease of a contact pressure force due to the contact between the glue roll and the corrugating roll. Only Pallas deals with the reduction of the distance between the glue roll and the corrugating roll depending on pressure forces.

In a first embodiment, Pallas uses one force-measuring unit whose measurement value is used for pressure control of the glue roll against the corrugating roll. No

hint is given as to utilize such a force-measuring unit in a calibrating process with respect to the glue gap width.

In a second embodiment, Pallas uses two force-measuring units and evaluates the difference of the measured values. Compared to the force evaluation according to claim 10, this scheme is complicated. Further, no hint is given to use this scheme in a calibration process.

Therefore, claim 10 is not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas teach a subsequent increase of the distance between the glue roll and the corrugating roll after these rolls came into contact with each other. Further, claim 11 recites all the features of claim 10. Therefore, claim 11 is not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas teach an increase of the bearing distance by an amount of 0.01 to 0.03 mm. Therefore, claim 12 is not obvious from Tokuno in view of Kanda and Pallas.

Claim 15 depends on claim 11. Therefore, claim 15 not obvious from Tokuno in view of Kanda and Pallas.

Neither Tokuno nor Kanda nor Pallas show two contact-pressure units. Therefore, claim 16 is not obvious from Tokuno in view of Kanda and Pallas.

Pallas describes force-measuring units, but not with respect to a calibration device. Tokuno and Kanda show no force-measuring unit at all. Therefore, claim 17 is not obvious from Tokuno in view of Kanda and Pallas.

Kanda and Pallas show adjusting units but not with regard to a calibration device. Tokuno does not show two adjusting units. Therefore, claim 18 is not obvious from Tokuno in view of Kanda and Pallas.

Claims 19 and 20 depend on claim 18. Therefore, these claims are non-obvious over Tokuno in view of Kanda and Pallas.

d) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Weber

As pointed out above, Weber shows no machine for producing a corrugated cardboard sheet. Therefore, the skilled artisan trying to improve a machine for producing a corrugated cardboard sheet would not take into account Weber's disclosure.

Moreover, it is unlikely that the person of ordinary skill in the art would attempt to combine four unrelated

references to improve a machine for producing a corrugated cardboard sheet. Even if such a skilled person were to tentatively attempt to do so, such a combination would not lead to the subject of the claims of the present application:

The similarity of the ends 22 of Weber's roll 10 with the stop rings of the present invention is only by accident, and there is no incentive to make such a change. No hint is given by Weber to incorporate the ends 22 of the roll 10 disclosed there into a calibrating device or process according to the present invention. The purpose of the ends 22 of Weber's roll 10 is totally different from that of the stop rings on the glue roll of the present invention. The ends 22 of Weber serve to prevent or reduce leakage from a chamber 24 of Weber's device as is described in column 3, lines 10/11. The purpose of the stop rings of the present application is to give a defined contact area during calibration of the glue gap width.

In no other respect does the disclosure of Weber go beyond that of, for example, Tokuno.

Therefore, claims 1 to 20, in particular claims 8 and 15 to 20 against which Weber is applied, are non-obvious over Tokuno in view of Kanda and Pallas and Weber.

e) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Rutkoskie

Rutkoskie discloses a printing press. The purpose of such a device is entirely different from that of a machine for producing a corrugated cardboard sheet. Therefore, the person of ordinary skill in the art, trying to improve a machine for producing a corrugated cardboard sheet, would not even take into account Rutkoskie's disclosure.

Moreover, as indicated above, it is quite unlikely that such a person of ordinary skill in the art would even attempt to combine four unrelated references to improve a machine for producing a corrugated cardboard sheet. Even if such person were to tentatively attempt to do so, such a combination would not lead to the subject of the claims of the present application:

One of Rutkoskie's rolls has two end collars. The outer diameter of these collars is not larger than the outer diameter of the rest of the roll. Therefore, Rutkoskie's disclosure with respect to the claimed subject does not go beyond that of Weber.

Therefore, claims 1 to 20, in particular claims 8 and 15 to 20 against which Rutkoskie is particularly applied, are non-obvious over Tokuno in view of Kanda and Pallas and Rutkoskie.

f) Non-Obviousness Over Tokuno, Kanda and Pallas and Narang

Narang deals with a gluing device for planar substrates. It is clear that this device serves for a substantially different purpose than that of the machine and the process of the present invention. Therefore, the skilled artisan trying to improve a machine for producing a corrugated cardboard sheet would not take into account Narang's disclosure.

Moreover, as indicated above, it is quite unlikely that such a person of ordinary skill in the art would even attempt to combine four unrelated references to improve a machine for producing a corrugated cardboard sheet. Even if such a person were to tentatively attempt to do so, such a combination would not lead to the subject of the claims of the present application.

Narang shows a roll 46 having a drive pulley 47. This drive pulley serves a totally different purpose than the stop ring according to claim 8. The disclosure of Narang with respect to the claimed subjects therefore does not go beyond that of a combination of Tokuno and Weber.

Therefore, claims 1 to 20, in particular claims 8 and 15 to 20 against which Narang is particularly applied, are non-obvious over Tokuno in view of Kanda and Pallas and Narang.

g) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Berthelot

Berthelot shows a doctor roll 1 having sleeves 2 with an outer diameter larger than that of the rest of the doctor roll. These sleeves serve to control the amount of glue applied to the glue roll. Therefore, they have a quite different purpose than that of the stop ring as stipulated in claim 8. Control of the amount of glue applied to the glue roll is irrelevant with respect to appellants' stop rings.

Moreover, as indicated above, it is quite unlikely that such a person of ordinary skill in the art would even attempt to combine four unrelated references to improve a machine for producing a corrugated cardboard sheet. Even if such a person were to tentatively attempt to do so, such a combination would not lead to the subject of the claims of the present application.

Berthelot's disclosure does not go beyond that of a combination of Tokuno and Weber. Therefore, claims 1 to 20, in particular claims 8 and 15 to 20 against which Berthelot is particularly applied, are not obvious from Tokuno in view of Kanda and Pallas and Berthelot.

h) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Weber and Rutkoskie and Narang and Berthelot

As the combined disclosure of Weber, Rutkoskie, Narang and Berthelot does not go beyond that of for example a combination of Tokuno and Berthelot, the skilled artisan has no additional hints as to the claimed subject matter when consulting these additional references.

Therefore, claim 8 and 15 to 20 are not obvious from Tokuno in view of Kanda and Pallas and Weber and Rutkoskie and Narang and Berthelot considered together.

Appellants wish to respectfully note in passing that this last rejection, as understood, involves a combination of seven references, most of which are quite unrelated to one another for the reasons already pointed out above. While appellants agree that a reasonable rejection where the teachings of the combination and the resultant combination are clear may involve elements from a plurality of references so long as they truly collectively make obvious the subject matter to be patented, it is also true that the greater the number of references strung together, the less likely it is that the proposed combination was truly obvious.

In the words of Circuit Judge Medina in *Ling-Temco-Vought, Inc. v. Kollsman Instrument Corporation* (2d Cir., 1967) 152 USPQ 446,51:

> It is apparent that the more numerous the references…, the less likely it becomes that a person having ordinary skill in the art would have arrived at the result reached by the patent in suit. … [citations omitted].

In *Bela Seating Company, Inc. v. Poloron Products, Inc.*, 160 USPQ 646,61, the Court concluded that the stringing together of a plurality of patents in an "attempt to invalidate plaintiff's claims tends in and of itself to negate the position of defendant that the patent in suit is invalid".

i) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Williams

Williams is applied as a quaternary reference against claims 13 and 14 which depend from and incorporate the subject matter of claim 11. Williams has not been cited to make up for the deficiencies of Tokuno in view of Kanda and Pallas as applied against claim 11 incorporated into claims 13 and 14, and Williams does not do so, i.e. Williams has only been applied with respect to the dependent portions of claims 13 and 14. Thus, claims 13 and 14 define nonobvious subject matter over the proposed combination because such a proposed combination of the four citations would not have made obvious what is called for in the claim 11 portion of claims 13 and 14, even if the proposed combination were obvious.

Moreover, Williams does not even make obvious what is recited in the dependent portions of claims 13 and 14. Thus, the dependent portion of claim 13 requires the corrugating roll and the glue roll to be rotationally driven at different circumferential speeds. But Williams does not even disclose a corrugating roll, and therefore cannot disclose a corrugating roll and a glue roll being rotationally driven at different circumferential speeds. Therefore, even for the dependent portions of claims 13 and 14, reliance on Williams involves an extrapolation beyond the teachings of the reference.

Therefore, claims 13 and 14 are not obvious from Tokuno in view of Kanda and Pallas and Williams.

j) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Kohler

As noted above, Kohler's machine deals with gluing of several single facers together. There is no disclosure in Kohler of how the corrugated sheet is glued to the first liner sheet. While the glue roll 48 and the rider roll 52 are driven at different circumferential speeds, there is no disclosure, as called for in the dependent claim portion of claims 13 and 14, of driving any corrugating roll at a different circumferential speed than the glue roll. Therefore, Kohler does not make obvious even that for which

it is relied upon, i.e. the dependent claim portions of claims 13 and 14.

Perhaps more importantly, however, Kohler does not make up for (and has not been cited to make up for) the deficiencies of the proposed combination of Tokuno, Kanda and Pallas as pointed out above which are relied on by the examiner for the portions of claims 13 and 14 which appear in claim 11.

Therefore, claims 13 and 14 are not obvious from Tokuno in view of Kanda and Pallas and Kohler.

k) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Thorn

Thorn's machine deals with gluing of several single facers together. Like Kohler and Williams, Thorn does not disclose even only what is recited in the dependent portions of claims 13 and 14, i.e. a corrugating roll rotationally driven at a different circumferential speed than the glue roll, because Thorn shows no corrugating roll.

Moreover, even if *ad arguendo* Thorn were considered to make obvious the dependent portions of claims 13 and 14, the proposed combination still would not have made claims 13 and 14 obvious because of the aforementioned deficiencies in the proposed combination of Tokuno in view of Kanda and

Pallas as applied to claim 11, the latter of which is incorporated into claims 13 and 14.

Therefore, claims 13 and 14 are not obvious from Tokuno in view of Kanda and Pallas and Thorn.

1) Non-Obviousness Over Tokuno in View of Kanda and Pallas and Williams and Kohler and Thorn

It is noted that the disclosures of Williams and Thorn do not go beyond that of Kohler with respect to the claimed subjects.

Therefore, claims 13 and 14 are not obvious from Tokuno in view of Kanda and Pallas and Williams and Kohler and Thorn.

THE DECLARATION

The examiner refers to the Declaration of the present inventors, filed with the Reply of March 17, 2003, and executed on February 28, 2003, as presenting arguments. This is incorrect, as the Declaration does not argue anything. Instead, the Declaration is **evidence** based on the knowledge and expertise of the declarants.

The Declaration thus presents statements of fact which will not be repeated here. The examiner has no legal justification for brushing off statements of fact as arguments.

To the extent that such Declaration may also contain some opinions, these are opinions of experts and may not be properly disregarded. But even if the Declaration does contain some expert opinion, and even if such expert opinion is improperly disregarded, the statements of fact, which support appellants' arguments, cannot be properly brushed aside as the examiner has done.

THE EXAMINERS HAVE NOT MET THEIR BURDEN

It has pointed out above at great length that the references are not only individually deficient, but importantly (1) are not obviously combinable and (2) even if combined do not reach the claims. In at least some instances, the rejections appear to acknowledge the deficiencies of the references in combination, and the rejections then proceed on the basis of speculation without any supporting evidence. Appellants provide a few examples below.

In the bottom paragraph on page 6 of the Final Rejection, the following statement appears:

> The apparatus claims do not require calibration of the measured width of the gap sensor prior to adjustment. **However, the apparatus shown in the references are fully capable of such a calibration.** Furthermore, it is notoriously well known to calibrate measurement devices prior to use. (emphasis added)

Calibration is of course a fundamental starting point according to the present invention. The rejection appears to acknowledge that the prior art does not show any calibration, although "the references are fully capable of such a calibration". Of course capability is not obviousness, e.g. *In re White et al*, 177 USPQ 758, 761 (CCPA 1973); *Ex parte Levengood*, 28 USPQ2d 1300, 10301 (BPAI 1993). In this latter case the Honorable Board stated as follows:

> In this case, … the only suggestion for the examiner's combination of the isolated teachings of the applied references improperly stems from appellant's disclosure and not from the applied prior art. *In re Ehrreich*, 590 F.2d 902 USPQ 504 (CCPA 1979). At best, the examiner's comments regarding obviousness amount to an assertion that one of ordinary skill in the relevant art would have been able to arrive at appellant's invention because he had the necessary skills to carry out the requisite process steps. This is an inappropriate standard for obviousness. See *Orthokenetics Inc. v. Safety Travel Chairs Inc.*, 806 F.2d 1565, 1 USPQ2d 1081 (fed. Cir. 1986). **That which is within the capabilities of one skilled in the art is not synonymous with obviousness.** *Ex parte Gerlach*, 212 USPQ 471 (Bd.App. 1980). See also footnote 16 of *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1092, 227 USPQ 337, 343 (Fed. Cir. 1985). (emphasis added).

As regards the last statement quoted above from the rejection that some feature is notoriously well known, appellants respectfully point out that the examiner has cited and applied many references, yet **none** teach any calibration whatsoever,

let alone **appellants' calibration**, an important feature of the present invention.

Thus, the examiner **has presented no evidence whatsoever** pointing out how **appellants' calibration** is "notoriously well known". As regards evidence, the Board stated in *Levengood, supra* at page 1301:

> The examiner notes that each reference discloses a different aspect of the claimed process. The examiner also notes that all aspects were "well known in the art". The examiner then indicates that because the various aspects of the claimed process were individually known in the art, the modifications of the electrophoretic process of Levengood by exposing Levengood's plant materials to cell-associated materials in order to "graft" or otherwise incorporate the cell associated material into the plants was "*well within the ordinary skill of the art* at the time the claimed invention was made".
>
> We reverse the rejection because the examiner has used the wrong standard of obviousness.
>
> Obviousness is a legal conclusion, the determination of which is a question of patent law. [citation omitted]. In order to establish a *prima facie* case of obviousness **it is necessary for the examiner to present *evidence*** [footnote omitted], preferably in the form of some teaching, suggestion, incentive or inference in the applied prior art, or in the form of generally available knowledge, that one having ordinary skill in the art *would have been led* to combine the relevant teachings of the applied references in the proposed manner to arrive at the claimed invention See, for example, *Carella v. Starlight Archery* 804 F.2d 135, 231 USPQ

644 (Fed. Cir. 1986); *Ashland Oil, Inc.* v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985). (italics in original; emphasis added)

The examiners have not met their burden.

Another example of the deficiencies of the rejections appears in the paragraph spanning pages 10 and 11 of the Final Action. As pointed out above, no prior art provides end caps as claimed in claim 8. The subsidiary references which are applied to show end caps show other things for other purposes. No motive or incentive exists for the proposed combinations. Yet, when no prior art can be found, it is easy for the examiner to simply state that "it is notoriously well known" or that it is obvious. Again, the rejections provide no evidence.

Appellants believe that all points have been generally addressed, even though appellants do not specifically address each point raised in the Final Action and in the Advisory Actions. That appellants have not addressed specifically each point raised in the Final Rejection and the Advisory Actions is not to be taken as any acquiescence of the examiner's position on any of these points, as evidenced by appellants' lengthy arguments above.

CONCLUSION

Appellants respectfully submit that the combination rejections are unreasonable, that no *prima facie* case of obviousness has been established, and therefore the examiners have not met their burden.

The present invention defines structural, functional and procedural differences over the prior art as pointed out above, even assuming *ad arguendo* that the various combinations as proposed were obvious, i.e. the present invention defines over even the reconstructions built up by the proposed combinations for the reasons set forth in substantial detail above.

Moreover, the proposed combinations would not have been obvious to the person of ordinary skill in the present art at the time the claimed invention was made. Not only is there no reason, motive or incentive for trying to reconstruct Tokuno in view of the various other citations, but in the case of Pallas, which is antithetical to Tokuno, because its teachings are based on an entirely different principle, the combination could not have been obvious. As regards the various quaternary citations, they are applied in the rejections without recourse to their lack of relationship with either Tokuno or Kanda and Pallas.

Appellants respectfully repeat that the examiners have not met their burden in establishing that the present invention would have been obvious to a person of ordinary skill in the art at the time it was made. The rejections should therefore be reversed, and such is respectfully prayed.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant(s)

By _____
Sheridan Neimark
Registration No. 20,520

SN:jaa
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
G:\bn\r\rau\mensing1\pto\brief my03.doc

APPENDIX

1. A machine for producing a corrugated cardboard sheet, which incorporates at least one corrugated sheet (51) with corrugation crests (52) and at least one liner sheet (53) that is glued to the corrugation crests (52), comprising

- at least one corrugating roll (3), which serves to give the corrugated sheet (51) its shape, incorporating
  - a corrugating-roll axis (7) around which the corrugating roll (3) can rotate,
  - a first corrugating-roll end with a first corrugating-roll bearing journal (31), which is mounted in a first corrugating-roll bearing (33), and
  - a second corrugating-roll end with a second corrugating-roll bearing journal (31'), which is mounted in a second corrugating-roll bearing (33'),
- a gluing device (13) for applying glue onto the corrugation crests (52) by a glue roll (22)
  - incorporating a glue-roll axis (28), around which the glue roll (22) can rotate, and which

extends parallel to the corrugating-roll axis (7),

- incorporating a first glue-roll end with a first glue-roll bearing journal (25) mounted in a first glue-roll bearing (27), which corresponds to the first corrugating-roll bearing (33),
- incorporating a second glue-roll end with a second glue-roll bearing journal (25') mounted in a second glue-roll bearing (27'), which corresponds to the second corrugated-roll bearing (33'),
- delimiting, between itself and the corrugating roll (3), a glue gap (30) of a width B, and
- advanceable towards the corrugating roll (3) for adjusting the width B of the glue gap (30), and

- a calibration device (37) for adjusting the width B of the glue gap (30) having
  - at least one contact-pressure unit (38, 38') for pressing a glue-roll bearing (27, 27') against the corresponding corrugating-roll bearing (33, 33') with a contact-pressure force A,

- at least one force-measuring unit (41, 41') for measuring a force of a bearing contact pressure P between the pressed-on glue-roll bearing (27, 27') and the corresponding corrugating-roll bearing (33, 33'),
- at least one adjusting unit (42, 42') for adjusting a bearing distance L between a pressed-on glue-roll bearing (27, 27') and the corresponding corrugating-roll bearing (33, 33'), and
- at least one control unit (49, 49'), which is connected to the at least one force-measuring unit (41, 41') and the at least one adjusting unit (42, 42') for the transfer of signals, and which activates the at least one adjusting unit (42, 42') in such a way that at least one bearing distance L is reduced, until the force of the bearing contact pressure P decreases based on the glue roll (22) and the corrugating roll (3) coming into contact with one another.

2. A machine as set forth in claim 1, wherein the control unit (49, 49') is connected, for the purpose of transferring signals, to the contact-pressure unit (38, 38').

3. A machine as set forth in claim 1, wherein the calibration device (37) incorporates two contact-pressure units (38, 38').

4. A machine as set forth in claim 1, wherein the calibration device (37) incorporates two force-measuring units (41, 41').

5. A machine as set forth in claim 4, wherein the calibration device (37) incorporates two adjusting units (42, 42').

6. A machine as set forth in claim 5, wherein at least one of the adjusting units (42, 42') incorporates two wedges (43, 44; 43', 44') that are displaceable relative to one another.

7. A machine as set forth in claim 6, wherein one wedge (44, 44') of the at least one adjusting unit (42, 42') is movable by a drive mechanism relative to the other wedge (43, 43'), which is stationary.

8. A machine for producing a corrugated cardboard sheet, which incorporates at least one corrugated sheet (51) with corrugation crests (52) and at least one liner sheet (53) that is glued to the corrugation crests (52), comprising

- at least one corrugating roll (3), which serves to give the corrugated sheet (51) its shape, incorporating
  - a corrugating-roll axis (7) around which the corrugating roll (3) can rotate,
  - a first corrugating-roll end with a first corrugating-roll bearing journal (31), which is mounted in a first corrugating-roll bearing (33), and
  - a second corrugating-roll end with a second corrugating-roll bearing journal (31'), which is mounted in a second corrugating-roll bearing (33'),
- a gluing device (13) for applying glue onto the corrugation crests (52) by a glue roll (22)
  - incorporating a glue-roll axis (28), around which the glue roll (22) can rotate, and which extends parallel to the corrugating-roll axis (7),
  - incorporating a first glue-roll end with a first glue-roll bearing journal (25) mounted in a first glue-roll bearing (27), which corresponds to the first corrugating-roll bearing (33),

- incorporating a second glue-roll end with a second glue-roll bearing journal (25') mounted in a second glue-roll bearing (27'), which corresponds to the second corrugated-roll bearing (33'),
- delimiting, between itself and the corrugating roll (3), a glue gap (30) of a width B, and
- advanceable towards the corrugating roll (3) for adjusting the width B of the glue gap (30), and

- a calibration device (37) for adjusting the width B of the glue gap (30) having
  - at least one contact-pressure unit (38, 38') for pressing a glue-roll bearing (27, 27') against the corresponding corrugating-roll bearing (33, 33') with a contact-pressure force A,
  - at least one force-measuring unit (41, 41') for measuring a force of a bearing contact pressure P between the pressed-on glue-roll bearing (27, 27') and the corresponding corrugating-roll bearing (33, 33'),

    at least one adjusting unit (42, 42') for adjusting a bearing distance L between a pressed-on glue-roll bearing (27, 27') and the

corresponding corrugating-roll bearing (33, 33'), and

- at least one control unit (49, 49'), which is connected to the at least one force-measuring unit (41, 41') and the at least one adjusting unit (42, 42') for the transfer of signals, and which activates the at least one adjusting unit (42, 42') in such a way that at least one bearing distance L is reduced, until the force of the bearing contact pressure P decreases based on the glue roll (22) and the corrugating roll (3) coming into contact with one another,

wherein the glue roll (22) incorporates, on at least one glue-roll end, a stop ring (36a, 36a') that is arranged concentrically to the glue-roll axis (28) and has an outer diameter D_A, that the glue roll (22) has an outer diameter D_L, and that the following is true for the outer diameters D_A and D_L: $D_A > D_L$.

9. A machine as set forth in claim 1, wherein the corrugating roll has a corrugated sheet (51) that is at least partly wrapped around the former, and that the at least one adjusting unit (42, 42') comprises activation means (45) activating the adjustment unit (42, 42') to reduce a bearing distance L until the force of the bearing contact pressure P

decreases due to the glue roll (22) and the corrugated sheet (51) coming into contact with one another.

10. A process for calibrating a machine for producing a corrugated cardboard sheet, comprising the following steps:

- providing a machine for producing a corrugated cardboard sheet, which incorporates at least one corrugated sheet (51) with corrugation crests (52) and at least one liner sheet (53) that is glued to the corrugation crests (52), comprising
  - at least one corrugating roll (3), which serves to give the corrugated sheet (51) its shape, incorporating a corrugating-roll axis (7) around which the corrugation roll (3) can rotate, a first corrugating-roll end with a first corrugating-roll bearing journal (31), which is mounted in a first corrugating-roll bearing (33), and a second corrugating-roll end with a second corrugating-roll bearing journal (31'), which is mounted in a second corrugating-roll bearing (33'),
  - a gluing device (13) for applying glue onto the corrugation crests (52) by a glue roll (22), incorporating a glue-roll axis (28), around

which the glue roll (22) can rotate and which extends parallel to the corrugating-roll axis (7), incorporating a first glue-roll end with a first glue-roll bearing journal (25) mounted in a first glue-roll bearing (27), which corresponds to the first corrugating-roll bearing (33), incorporating a second glue-roll end with a second glue-roll bearing journal (25') mounted in a second glue-roll bearing (27'), which corresponds to the second corrugated-roll bearing (33'), delimiting, between itself and the corrugating roll (3), a glue gap (30) of a width B, and advanceable towards the corrugating roll (3) for adjusting the width B of the glue gap (30), and

- a calibration device (37) for adjusting the width B of the glue gap (30) having at least one contact-pressure unit (38, 38') for pressing a glue-roll bearing (27, 27') against the corresponding corrugating-roll bearing (33, 33') with a contact-pressure force A, at least one force-measuring unit (41, 41') for measuring a bearing contact pressure P between the pressed-on glue-roll bearing (27, 27') and

the corresponding corrugating-roll bearing (33, 33'), and at least one adjusting unit (42, 42') for adjusting a bearing distance L between a pressed-on glue-roll bearing (27, 27') and the corresponding corrugating-roll bearing (33, 33').

- positioning of the glue roll (22) in a starting position in which the glue roll (22) is not in contact with the corrugating roll (3), and
- reducing at least one bearing distance L by means of the adjusting unit (42), until the force of the bearing contact pressure P decreases due to a contact between the glue roll (22) and the corrugating roll (3).

11. A process for calibrating a machine for producing a corrugated cardboard sheet, comprising the following steps:

- providing a machine for producing a corrugated cardboard sheet, which incorporates at least one corrugated sheet (51) with corrugation crests (52) and at least one liner sheet (53) that is glued to the corrugation crests (52), comprising
  - at least one corrugating roll (3), which serves to give the corrugated sheet (51) its shape,

incorporating a corrugating-roll axis (7) around which the corrugation roll (3) can rotate, a first corrugating-roll end with a first corrugating-roll bearing journal (31), which is mounted in a first corrugating-roll bearing (33), and a second corrugating-roll end with a second corrugating-roll bearing journal (31'), which is mounted in a second corrugating-roll bearing (33'),

- a gluing device (13) for applying glue onto the corrugation crests (52) by a glue roll (22), incorporating a glue-roll axis (28), around which the glue roll (22) can rotate and which extends parallel to the corrugating-roll axis (7), incorporating a first glue-roll end with a first glue-roll bearing journal (25) mounted in a first glue-roll bearing (27), which corresponds to the first corrugating-roll bearing (33), incorporating a second glue-roll end with a second glue-roll bearing journal (25') mounted in a second glue-roll bearing (27'), which corresponds to the second corrugated-roll bearing (33'), delimiting, between itself and the corrugating roll (3), a

glue gap (30) of a width B, and advanceable towards the corrugating roll (3) for adjusting the width B of the glue gap (30), and

- a calibration device (37) for adjusting the width B of the glue gap (30) having at least one contact-pressure unit (38, 38') for pressing a glue-roll bearing (27, 27') against the corresponding corrugating-roll bearing (33, 33') with a contact-pressure force A, at least one force-measuring unit (41, 41') for measuring a bearing contact pressure P between the pressed-on glue-roll bearing (27, 27') and the corresponding corrugating-roll bearing (33, 33'), and at least one adjusting unit (42, 42') for adjusting a bearing distance L between a pressed-on glue-roll bearing (27, 27') and the corresponding corrugating-roll bearing (33, 33').

- positioning of the glue roll (22) in a starting position in which the glue roll (22) is not in contact with the corrugating roll (3), and
- reducing at least one bearing distance L by means of the adjusting unit (42), until the force of the bearing contact pressure P decreases due to a

contact between the glue roll (22) and the corrugating roll (3),

wherein a corrugated sheet (51) is guided over the corrugating roll (3), that the bearing distance is reduced until the force of the bearing contact pressure P decreases when the glue roll (22) and corrugated sheet (51) come into contact with one another, and that the bearing distance L is subsequently increased by a predetermined amount.

12. A process as set forth in claim 11, wherein the bearing distance L is increased by an amount of 0.01 to 0.03 mm.

13. A process as set forth in claim 11, wherein the corrugating roll (3) and the glue roll (22) are rotationally driven at different circumferential speeds.

14. A process as set forth in claim 13, wherein the glue roll (22) rotates at a circumferential speed that is 1 to 10% slower than that of the corrugating roll (3) with the corrugated sheet (51).

15. A machine as set forth in claim 8, wherein the control unit (49, 49') is connected, for the purpose of transferring signals, to the contact-pressure unit (38, 38').

16. A machine as set forth in claim 8, wherein the calibration device (37) incorporates two contact-pressure units (38, 38').

17. A machine as set forth in claim 8, wherein the calibration device (37) incorporates two force-measuring units (41, 41').

18. A machine as set forth in claim 8, wherein the calibration device (37) incorporates two adjusting units (42, 42').

19. A machine as set forth in claim 8, wherein one wedge (44, 44') of the at least one adjusting unit (42, 42') is movable by a drive mechanism relative to another wedge (43, 43').

20. A machine as set forth in claim 19, wherein one wedge (44, 44') of the at least one adjusting unit (42, 42') is movable by a drive relative to another stationary wedge (43, 43').