(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 022 722 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.02.2009 Bulletin 2009/07

(51) Int Cl.:
B65C 9/18 *(2006.01)*

(21) Application number: **08013726.8**

(22) Date of filing: **31.07.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(30) Priority: **09.08.2007 IT MI20071664**

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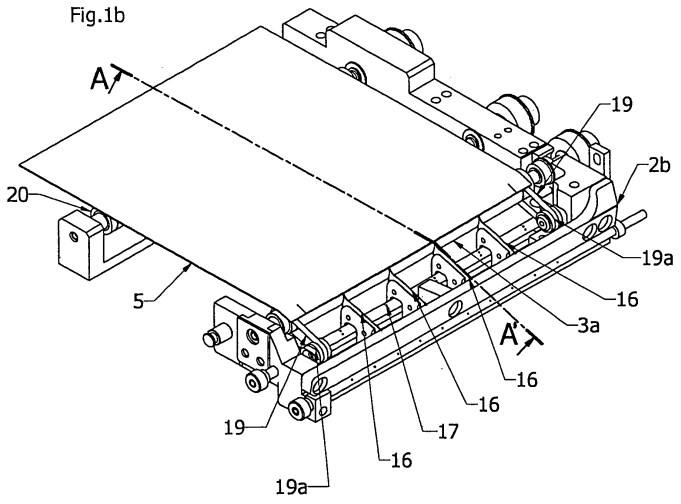
(54) Labelling machine

(57) A machine for printing and applying labels on containers, comprising:
- a reel (1) of adhesive tape (5) from which the labels are formed;
- an unwinding system of the reel (1) comprising at least an unwinding roll (8) and a tensioning device (9) of tape (5);
- optionally a photocell (4) between the unwinding system of the reel (1) and the printing group;
- a tape (5) adhesivized on the internal side of reel (1);
- a printing group (3) comprising a printing system formed of a printing head (3b) and a rotating driving roll (3a) for the tape (5) that cyclically inverts its rotation direction;
- cutting system (2) comprising:
- a cutting blade (2a);
- a counterblade (2b);
- an applying pad (6);

wherein:
- between the roll (3a) and the counterblade (2b) a lamina (16) is inserted perpendicularly to the longitudinal axis of roll (3a), one end of said lamina being one end positioned near the upper edge of the counterblade (2b) and the opposite end near the roll (3a).

Fig.1b



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Description

[0001] The present invention relates to a machine for printing and applying self-adhesive labels from adhesivized reels, in particular usable for identification systems to be applied to containers, in particular to boxes, parcels, packages, pallets.

[0002] More specifically the invention relates to machines for applying labels in real time and also working on packages from different lines, the labels being of various sizes and content.

[0003] Machines applying prepunched labels are known in the prior art. Said labels are formed by an adhesivized substratum (paper, plastic film, etc.) applied on an antiadhesive support, usually siliconized, forming the label carrier and release. During the application the label is printed, removed from the support and applied. The drawback of these systems is that the support is discarded and must be disposed of as special waste.

[0004] EP 1,447,333, in the name of the Applicant, describes a machine for printing and applying labels on containers comprising a reel (1) of tape adhesivized on the internal side from which the labels are formed; a reel unwinding system; a printing group (3) for the adhesivized tape comprising a printing system wherein the contact between the printing head and the adhesive tape is obtained by a driving roll cyclically inverting the rotation direction; a cutting system (2) of the printed tape forming the label and a piston for applying it located adjacent to the printing group. In particular the cutting system is formed by a blade (2a) and counterblade (2b). The former moves perpendicularly to the direction of the tape to be cut and with cutting edge forming an angle comprised between 2° and 45° with the tape. The cutting surfaces of the blade (2a) and counterblade (2b) are covered with antiadhesives.

[0005] This machine runs without jamming for about one week if it is operated at a speed of 18-20 labels (strokes)/minute and with tapes having a width of 80-120 mm. When the speed is increased for example up to 40 strokes/minute, this machine works satisfactorily only for about two days. Furthermore, by increasing the tape width from about 130 up to 220 mm and maintaining the speed at about 18-20 strokes/minute, the machine works satisfactorily for shorter times, of about three days. When tapes having a width more than 120 up to 220 mm are used and contemporaneously the speed is increased, from 30 up to 70 strokes/minute, the machine works correctly for shorter times, for example of the order of two hours.

[0006] The need was felt to have available an improved machine for printing and applying labels from adhesivized tapes capable to work with high productivity, i.e. with number of strokes/minute from 10 to 70, by using tapes having a width from 10 up to 300 mm, preferably from 40 to 240 mm, and without jamming or interruptions for longer times, of a least 40 days, preferably even of three months or more, compared to the prior art machines.

[0007] It has been surprisingly and unxepectedly found by the Applicant a machine for printing and applying labels, solving the above technical problem.

[0008] An object of the present invention is a machine for printing and applying labels on containers, etc., comprising (Fig. 1):

- a reel (1) (not reported in Fig. 1) of adhesive tape (5) from which the labels are formed;
- an unwinding system of the reel (1) (not reported in Fig. 1) comprising at least an unwinding roll (8) and a tensioning device (9) of tape (5), ((8) and (9) not reported in Fig. 1);
- optionally a photocell (4) (not reported in Fig. 1), positioned between the unwinding system of the reel (1) and the printing group (3);
- an adhesivized tape (5) preferably with the adhesive on the internal side of reel (1);
- a printing group (3) (not reported in Fig. 1), comprising a printing system wherein the contact between the printing head (3b) and the adhesivized tape (5) is obtained by a rotating driving roll, covered by an antiadherent material (3a), cyclically inverting the rotation direction);
  the cutting system (2) being adjacent to the printing group (3);
- a cutting system (2) comprising:
  - a cutting blade (2a), moving perpendicularly to the direction of tape (5) with the cutting edge forming an angle between 2° and 45°, preferably between 2° and 30°, with the tape (5);
  - a counterblade (2b);
    the cutting surfaces of the blade (2a) and counterblade (2b) are covered with antiadhesives, preferably solid antiadhesives;
- an applying pad (6) (not reported in Fig. 1) of the labels on the containers;
  wherein:
- between the roll (3a) and the counterblade (2b) a lamina (16) is inserted perpendicularly to the longitudinal axis of roll (3a), having one end positioned near the upper edge of the counterblade (2b) and the opposite end near the roll (3a).

[0009] Generally the distance of each of the ends of the lamina (16) from (2b) and (3b), respectively ranges from 0 to 12 mm, preferably from 0 to 5 mm.

[0010] The thickness of the lamina (16) can range from about 0.05 up to about 10 mm, preferably 0.1-2.5 mm, still more preferably 0.2-0.4 mm. The preferred thicknesses are suitable in particular used when tape (5) must be printed on the roll surface, also in the points where the lamina is inserted. Besides, it has been unexpectedly and surprisingly found by the Applicant that the more preferred thickness reduces the friction between tape (5) and lamina (16). In this way the adhesive release of tape

(5) on the lamina (16) is decreased. In order to favour the detachment of tape (5), a pipe (17) positioned longitudinally under the lamina (16) and perpendicular thereto, equipped with holes for the output of inert gases under pressure, can be used. The pressure ranges from 1 bar up to 10 bar, preferably from 2 to 5 bar. As suitable inert gases used, nitrogen, air, helium can be mentioned.
As an alternative to the pipe (17), it can be used an electrostatic field between roll (3a) and counterblade (2b). This can be obtained with permanent or temporary electromagnets.

[0011] Lamina (16), preferably, has one end not in contact with the upper edge of counterblade (2b) and the opposite end inserted into roll (3a) through grooves made in roll (3a). Lamina (16) preferably is shaped so that its upper side is tangential with respect to roll (3a). This embodiment is shown in Fig. 1 by the end part of lamina (16) in contact with roll (3a). The upper side of lamina (16) can also form a 0° or a negative angle with respect to a line perpendicular to the longitudinal axis of roll (3a). The negative angle can be for example up to about -10°. In Fig. 1 the perpendicular line can be represented also by (5) or by an horizontal line passing through the axis of roll (3a). As said, the preferred position is the tangential one corresponding to an angle of 35° for a diameter of roll (3a) of about 14 mm. Whene the printing does not comprise the area where the lamina which is inserted in the roll (3a) is present, a lamina thickness higher than 2.5 mm can also be used.
Preferably the lamina (16) is in contact, or at least partly in contact, with the counterblade (2b) or with the upper edge thereof. It has in fact unexpectedly and surprisingly found by the Applicant that, in these conditions the adhesive tape (5) is not blocked (e.g. by jamming) between the printing group (3) and the cutting group (2). In fact the movement of tape (5) is controlled by roll (3b) which moves tape (5) towards the cutting group (2) for forming the label and then moves the tape backwards for printing the new label.

[0012] More than one lamina (16) can be used and can have one end towards roll (3a), preferably inserted in roll (3a). In another embodiment of the invention part of the laminas (16) do not have one of the ends inserted in roll (3a). In a particularly preferred embodiment at least one of the laminas has one end inserted in roll (3a).

[0013] Preferably between roll (3a) and counterblade (2b) a plane (15) parallel to tape (5) is placed over tape (5). In this case tape (5), after unwinding from roll (3a) and after passing on lamina (16), aligns with plane (15). Plane (15) makes it easier the advancement of tape (5) to the cutting group (2). Inert gases under pressure flowing from the holes of pipe (17), favour the alignment.

[0014] The width of plane (15), measured in the direction of movement of tape (5), is generally comprised from about 30% to about 70% of the distance between roll (3a) and counterblade (2b). Preferably plane (15) is treated with antiadhesive material.

[0015] The distance between plane (15) and counterblade (2b) must be such as to allow the passage of tape (5). Higher distances can be used, for example of about 5-10 mm.

[0016] In order to make easier the advancement of tape (5), at the two ends of roll (3a) belts (19) can optionally be positioned to connect roll (3a) with pulley (19a) (see Fig. 1b). Preferably one belt is used for each end. Instead of belts, 0-rings can be used. The belts and 0-rings are preferably made of antiadherent material. Preferably roll (3a) is motorized.

[0017] A further preferred component used in the machine of the invention is at least one roll (20), positioned uphill roll (3a) and having the longitudinal axis parallel to that of roll (3a). The distance of roll (20) from roll (3a) ranges from 30 to 300 mm, preferably from 60 to 200 mm, more preferably from 50 to 120 mm. In this way the roll (20) keeps tape (5) in tension between the two rolls (20) and (3a). The dimensions of roll (20) can be the same or different from those of roll (3a). Preferably roll (20) is made of an antiadherent material.

[0018] Instead of rolls (20), horizontal driving planes, optionally motorized, for example eletrically and/or pneumatically, can be used. The planes are preferably coated with antiadherent material. According to the present invention, rolls (20) are preferred.

[0019] The machine of the present invention can work also for very long times, for example one or more months, for example three months or longer times, without showing the drawbacks of the prior art machines. Besides, as said, the machine of the invention can work at higher speeds, up to 70 labels/minute, in comparison with those of the prior art.

[0020] It has in fact unexpectedly and surprisingly been found that the prior art machines, also those using adhesivized tapes, satisfactorily work for about one week at speeds of about 18-20 strokes/minute with tapes having width from 80 mm to 120 mm. When the speed is increased, for example to 40 strokes/minute, they work satisfactorily for about two days. Furthermore it has been found by the Applicant that when the speed is of 18-20 strokes/minutes but with the tape width from about 130 to 220 mm, the prior art machines work satisfactorily for about three days. With tape width of about 130 up to 220 mm and speeds from 30 to 70 strokes/minute, the prior art machines work for about two hours without jamming.

[0021] The working of the machine of the invention is therefore unexpected and surprising.

[0022] The cutting systems can have various sizes. Generally their size, measured along the longitudinal direction of the tape, is preferably lower than 60 mm, more preferably lower than 40 mm. It is preferable to use cutting systems having a size as small as possible, for example 15-40 mm.

[0023] The unwinding roll (8) is preferably driven by an engine. The applying pad (6) is preferably driven by an electropneumatic device (7). The roll (3a) is preferably driven by a motor cyclically inverting the roll rotation direction.

[0024] The cutting blade (2a) is preferably driven by a linear pneumatic cylinder, the counterblade (2b) is mounted on a plate fixed or oscillating, preferably fixed. The contact between the counterblade (2b) and the blade (2a) is obtained by a system acting on the counterblade (2b) or on the blade (2a), preferably on the latter. The system can be a spring or a pneumatic cylinder or a pusher. The vertical section of the cutting blade (2a) can be flat or slightly curved with a radius generally comprised from 500 mm to 6,000 mm preferably from 1,500 mm to 4,000 mm. A flat blade is preferred. Preferably both sides of blade (2a) and counterblade (2b) are covered with solid antiadhesive coatings.

[0025] The antiadhesive treatment of the components of the invention machine as described above allows to avoid that the adhesive tape adheres on their surfaces. The antiadhesive treatment can, for example, be carried out by using materials based on (fluoro) silicones and/or fluoropolymers for obtaining antiadhesive solid coatings. One can mention, for example, and not limitedly to the types specified hereinafter, coatings with the commercial name of Plasma Coating® PC 918F, PC 936, PC 915, PC 915S, PC 934, PC 934S, PC 932, PC 918-C, PC 434, PC 432, 40601/4001F.

[0026] The roll (3a), as said, is made of antiadherent material, so that adhesivized tape (5) does not adhere to the roll (3a). The material of the roll (3a) is, for example, made by silicone resins, for example silicone rubbers.

[0027] As said, the engine acting on roll (3a) cyclically inverts the rotation direction. Alternatively, this can be obtained by modifying the firmware of the printing group.

[0028] In the printing group, the backward movement of tape (5) by roll (3a), preferably is from 1 mm to L mm, wherein L is the distance between the cutting blade and the printing head. L depends on the cutting system size, generally L is comprised between 15 and 60 mm. This value depends on the printing requirements. For example, this value is L-2 when the printing starts 2 mm from the upper margin of the label. With upper margin of the label it is meant the label side coming out first from the printing head.

[0029] With the printing system of the machine of the present invention, it is possible to print the adhesivized tape even near the upper edge of the label.

[0030] Tape (5), without the adhesive, has a thickness generally from about 30 micron to about 120 micron, preferably from 50 micron to 80 micron.

[0031] The adhesive amount spread on the support film, calculated on the dry, ranges from 10 to 30 g/m^2, preferably from 15 to 22 g/m^2.

[0032] The labels have various sizes depending on the requirements. Generally the label has the same width of the tape and ranges from 10 mm and 300 mm, preferably from 30 mm to 230 mm, the length can vary, for example up to 500 mm, generally from 20 mm to 200 mm, preferably from 30 mm to 180 mm.

[0033] The preferred tape for the labelling system is in plastic material preferably having the internal side, i.e. that turned towards the reel, adhesivized. The tape plastic film is preferably made of bioriented polypropylene, polyester, polyethylene, polyvinylchloride, or also laminates, or plastic coupled articles in general.

[0034] The tape material can also be made of paper, thermosensitive paper of thermosensitive plastic material.

[0035] The used adhesive is available on the market and is selected among those allowing a permanent adhesion. In particular the adhesive is preferably a water acrylic adhesive, in aqueous emulsion form, based on a C_3-C_5 ester of the acrylic acid, for example butyl acrylate, or a "hot melt" adhesive formed of thermoplastic rubbers and hydrocarbon resins in general.

[0036] By using a preprinted adhesivized tape reel, it is possible to determine the label size through an optical reading system (photocell 4) which determines the cutting position.

[0037] In the printing group (3) tape (5) passes between the driving roll (3a) and the printing head (3b).

[0038] In the printing group (3), as said, roll (3a) drives tape (5) (Fig. 1).

[0039] The applying/labelling machine of the present invention is represented according to a preferred embodiment as reported in the Figures:

Fig. 1: representation in vertical section along A-A' of Fig. 1b.
Fig. 1b: representation of the machine when the tape (5) is at the beginning of the roll (3a).
Fig. 2: as Fig. 1 but with tape (5) being on the laminas (16).
Fig. 2b: as Fig. 1b but with tape (5) being on the laminas (16).
Fig. 3: as Fig. 1 but with tape (5) being on the counterblade (2b).
Fig. 3b: as Fig. 1b with tape (5) being on the counterblade (2b).

[0040] More specifically in Fig. 1b:

(3a) the driving roll,
(5) the tape,
(16) the laminas,
(17) the perforated pipe for the the gas outflowing,
(2b) the counterblade of the cutting system,
(20) the roll, (19) the O-ring connecting roll (3a) with pulley (19a).

[0041] In Fig. 1 the reported numbers have the same meaning as those reported in Fig. 1b, (3b) is the printing head, plane (15) being over tape (5), (2a) represents the blade of the cutting system.

[0042] In Figs. 2b and 3b the numbers have the same meaning as those of Fig. 1b. It changes only the position of tape (5), which is on roll (3a) in Fig. 1b, and is on the laminas (16) in Fig. 2b and is on counterblade (2b) in Fig. 3b.

[0043] In Figs. 2 and 3 the numbers have the same meanings as in Fig. 1, but the tape (5) is in Fig. 1 is on roll (3a), in Fig. 2 on laminas (16), in Fig. 3 on the counterblade (2b).

[0044] The working process of the machine of the present invention is the following. Tape (5) is unwound from the reel (1) by the unwinding system comprising (8) and (9), proceeds into the printing group (3) for the label print and/or overprint.

[0045] Tape (5) proceeds on roll (3a), then on lamina (16) and after into the cutting system (2) moving in a direction perpendicular to the cutting blade (2a), which cuts the tape with an angle, preferably constant, the contact point between the blade (2a) and counterblade (2b) during cutting moves transversally in a continuous way through tape (5). After cutting, the printed label is immediately applied on the container (box) by the applying pad (6).

[0046] After the label application, the adhesivized tape (5) is moved backward by roll (3a), passing on the lamina 16 and stopping on roll (3a) thus allowing the printing head (3b) to start printing near the upper edge of the forming label. Then tape (5) enters into the cutting system (2), a new label is cut and the cycle starts again.

[0047] Furthermore, during the machine working, it is not required the application of lubricating oils on the blade and counterblade, which could stain the label and the container on which it is applied. The use of lubricating oils is rather critical, especially for food packages, since they represent a critical contamination source according to the rules and procedures HACCP (Hazard Assessment Critical Control Point). According to these rules the oil must not come into contact, directly or indirectly, with the food or their packages. Furthermore oil traces on the adhesive part of the label reduce the adhesion on the package.

[0048] The label printing is preferably carried out by a direct or indirect thermal process or by using laser or inkjet printers.

[0049] The label text is previously programmed by the user, for example through a software. Generally the text contains for example the following information codes for identifiifying the product, the customer, the supplier, the producer, etc. and can be personalized.

[0050] By the software it is possible to store in the memory of the computer labels having different features as regards the format and the text (logo, firm data, production codes, expiry dates, etc.). In connection with the production requirements the appropriate labels are applied on the product on the packaging line.

[0051] By using the machine of the present invention it is possible to change on the packaging line the sizes and the text of the label from a package to another, even more times or even in a continuous way, if required, without interrupting the production cycle.

[0052] It is indeed possible, by using softwares available on the market, to identify on the packaging line the package on which applying a specific label.

[0053] In this way only one label station can be used for more production lines.

[0054] In fact it is not required the substitution of a tape with another of different size, provided that the width of the label is compatible with the width of the tape.

[0055] The printing/labelling machine of the present invention allows to obtain labels having a different length depending on the text of the labels. This represents a remarkable advantage with respect to the systems of the prior art, wherein labels having a fixed format are used. When in these known systems the label dimensions must be changed, it is necessary to change the reel. Furthermore another advantage of the machine of the present invention is that the siliconized support (carrier) is not used, thus avoiding a disposal unit.

[0056] As said, the machine of the present invention results improved in comparison with the machines of the prior art (see the examples) since with the latter it is not possible to use high speeds, higher than 18/20 strokes/minute, without jamming, using adhesivized tapes. Besides, the prior art machines can be used without jamming when the tape has widths up to 120 mm. From an industrial point of view the machine of the present invention assures an improved productivity even with labels having a width higher than 120 mm, even up to 300 mm.

[0057] The label application system can be carried out in various ways. For example, a piston system (7) can be used.

[0058] As said, a further advantage of the present invention machine is that it is not necessary to have available tapes with prepunched labels having a different format (length).

[0059] As applying machine of the prior art, the Applicant has used the applying machine of EP 1,447,333, as described in Fig. 1 of this patent.

[0060] The following Examples illustrate the invention and do not limit the scope thereof.

EXAMPLES

EXAMPLE 1

[0061] At the outlet of an end line Beretti mod. MS30 cardboard box wrapping machine, a machine for printing and applying labels according to Fig. 1 of the present invention has been positioned. In said machine lamina (16) has been positioned inserted in roll (3a), at half of the longitudinal width of the roll (3a). The components (20 (19) and (15) have not instead been installed.

[0062] The machine is connected to a computer with a software for printing on labels the requested information. The boxes which have been labelled had 380 X 250 X 300 mm sizes. The applied labels had 120 mm (width) X 80 mm (length) sizes and have been formed by directly cutting the tape of a 50 μm polypropylene reel adhesivized with acrylic adhesive Primal® PS 83d (Rohm & Haas), weight 20-22 g/m^2, having a width of 120 mm and a length of 800 m.

[0063] By a thermal transfer printer the following information were printed on the label: product, number of items contained in the box, batch number, bar code, progressive package number, date, time of the label application. The label text was distributed on the whole label surface, up to a distance of 2 mm from the upper edge.

[0064] The last label printed by the machine is applied in real time on the first container moving to the labelling station.

[0065] The machine of the present invention operated without interruptions for the whole working time of 8 hours on each day. The line production speed was 18-20 boxes/minute (strokes/minute). No inconveniences on the machine occurred and to each package the proper label was applied with the applied printed labels resulted conforming to the corresponding model in the computer.

[0066] The labelling process with the labelling machine according to the present invention did not show any inconveniences from the industrial point of view, even after a working period of 3 months.

EXAMPLE 2

[0067] Example 1 has been repeated but increasing the line production speed to 50 packages/minute. The machine worked 12 hours each day. Even after 3 months, the labelling machine did not show inconveniences and no machine downtimes occurred.

EXAMPLE 3

[0068] Example 1 has been repeated but using labels havinh a width of 180 mm, the length being the same as in the Example 1, and the line production speed being of 50 boxes/minute. The machine was used for 12 hours each day. Even after 3 months of working the labelling machine did not show any inconveniences and no machine downtime occurred.

EXAMPLE 4

[0069] Example 2 has been repeated but the labelling machine comprised pipe (17), plane (15) and roll (20). Furthermore at each longitudinal end of the roll (3a) pulleys (19a) were inserted. Even after 6 months of working, the labelling machine did not show any inconvenience and no machine downtime occurred.

EXAMPLE 5

[0070] Example 2 has been repeated but the labelling machine comprised pipe (17), plane (15) and roll (20). Furthermore at each longitudinal end of the roll (3a) pulleys (19a) were inserted. Tape width was of 180 mm. The machine was operated for 12 hours on each day. Even after 5 months of working, the machine did not shown any inconvenience and no machine downtime occurred.

EXAMPLE 6 Comparative

[0071] At the outlet of an end line Beretti mod. MS30 cardboard box wrapping machine, a labelling machine according to EP 1,447,333 has been positioned. The applied labels had dimensions 120 mm (width) X 80 mm (length) and were formed by cutting directly a 50 μm polypropylene tape adhesivized with acrylic adhesive Primal® PS 83d (Rohm & Haas), weight 20-22 g/m^2, having a width of 120 mm and a length of 800 m. The machine operated without interruptions for the whole daily working time of 8 hours. The line production speed was 20 packages/minute. After a working period of one week jams occurred due to the adhesive tape winding on the roll (3a) in the correspondence of the printing head (3b). This part of the machine is represented in Fig. 3 of the patent. The production was stopped for tape removal.

EXAMPLE 7 Comparative

[0072] Example 6 comparative has been repeated but using labels having 180 mm (width) X 80 mm (length) sizes. The line production speed was 20 packages/minute. The machine was operated over a daily working time of 8 hours. After 3 days jams occurred due to the adhesive tape winding on the roll (3a) in correspondence with the printing head (3b). Also in this case the production had to be stopped for tape removal.

EXAMPLE 8 Comparative

[0073] Example 7 has been repeated but increasing the line speed to 30 packages/minute. After 2 hours the same jamming as reported in examples 6 comparative and 7 comparative occurred.

Claims

1. A machine for printing and applying labels on containers, comprising:

   - a reel (1) of adhesive tape (5) from which the labels are formed;
   - an unwinding system of the reel (1) comprising at least an unwinding roll (8) and a tensioning device (9) of the tape (5);
   - optionally a photocell (4) positioned between the unwinding system of the reel (1) and the printing group;
   - an adhesive tape (5) adhesivized preferably on the internal side of the reel;
   - a printing group (3) comprising a printing system wherein the contact between the printing head (3b) and the adhesivized tape (5) is obtained by a rotating driving roll covered by an antiadherent material (3a), which cyclically inverts the rotation direction;

the cutting system (2) being adjacent to the printing group (3);
- a cutting system (2) comprising:

- a cutting blade (2a) moving perpendicularly to the direction of adhesive tape (5) with the cutting edge forming an angle comprised between 2° and 45°, preferably between 2° and 30° with tape (5);
- a counterblade (2b);
the cutting surfaces of the blade (2a) and counterblade (2b) are covered with antiadhesives, preferably solid antiadhesives;

- an applying pad (6) of the labels on the containers; wherein:
- between the roll (3a) and the counterblade (2b) a lamina (16) is inserted perpendicularly to the longitudinal axis of roll (3a), one end of said lamina positioned near the upper edge of the counterblade (2b) and the opposite end positioned near the roll (3a).

2. A machine according to claim 1, wherein the distance of each of the ends of the lamina (16) from (2b) and from (3b) respectively ranges from 0 to 12 mm, preferably from 0 to 5 mm.

3. A machine according to claims 1-2, wherein the lamina (16) has a thickness from about 0.05 up to about 10 mm, preferably 0.1-2.5 mm, still more preferably from 0.2-0.4 mm.

4. A machine according to claims 1-3, wherein a pipe (17) equipped with holes is positioned longitudinally under the lamina (16).

5. A machine according to claim 4, wherein alternatively to pipe (17), an electrostatic field is used between roll (3a) and counterblade (2b).

6. A machine according to claims 1-5, wherein lamina (16) has one end not in contact with the upper edge of the counterblade (2b) and the opposite end inserted into the roll (3a) through grooves made in the roll (3a).

7. A machine according to claim 6, wherein the lamina (16) is in contact with the counterblade (2b).

8. A machine according to claims 1-7 comprising more laminas (16).

9. A machine according to claim 8, wherein a part of the laminas (16) are not inserted into the roll (3a).

10. A machine acording to claims 1-9, wherein between roll (3a) and counterblade (2b) a plane (15) parallel to tape (5) is placed over the tape (5).

11. A machine according to claim 10, wherein the width of the plane (15), measured in the advancing direction of the tape (5) is from about 30% and about 70% the distance between the roll (3a) and the counterblade (2b).

12. A machine according to claims 10-11, wherein the plane (15) is treated with antiadhesive material.

13. A machine according to claims 1-12, wherein at the longitudinal two ends of the roll (3a) belts (19) connecting the roll (3a) with the pulley (19a), are positioned.

14. A machine according to claims 1-13, wherein a roll (20) is positioned uphill the roll (3a) with the longitudinal axis parallel to that of roll (3a).

15. A machine according to claim 14, wherein the distance of roll (20) from roll (3a) ranges from 30 to 300 mm, preferably from 60 up to 200 mm, more preferably from 50 up to 120 mm.

16. A machine according to claims 1-15, wherin the tape (5), without the adhesive, has a thickness generally from about 30 micron to about 120 micron, preferably from 50 micron to 80 micron.

17. A machine according to claim 16, wherein the tape width is between 10 mm and 300 mm, preferably 30 mm-230 mm, the label length is not higher than 500 mm, preferably it is comprised between 20 mm and 200 mm, more preferably between 30 mm and 180 mm.

18. A machine according to claims 16-17, wherein the tape plastic film is made of bioriented polypropylene, polyester, polyethylene, polyvinylchloride, or also laminates, or plastic coupled articles in general, paper, thermosensitive paper or thermosensitive plastic material.

19. A process for printing and applying labels using the machine of claims 1-18 comprising the following steps:

- unwinding of tape (5) from reel (1) by an unwinding system;
- printing and/or overprinting of the tape (5) in the printing group (3);
- cutting of the printed tape (5) to form the label;
- application on the label on a container by means of the applying pad (6);
- roll (3a) moves back tape (5) after label application;

wherein
the tape (5) passes on the lamina (16):

- before entering the cutting system (2);
- when it is moved backward by roll (3a), after the label application.

Fig.1b

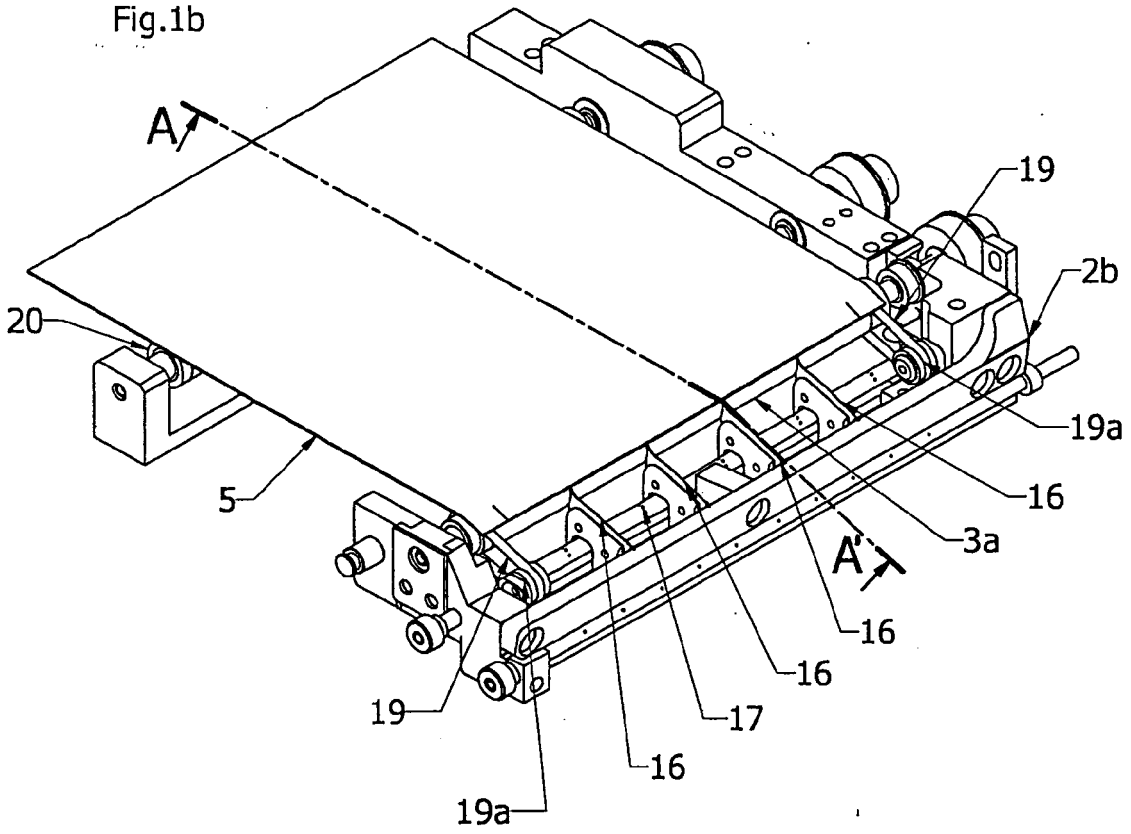


Fig.1

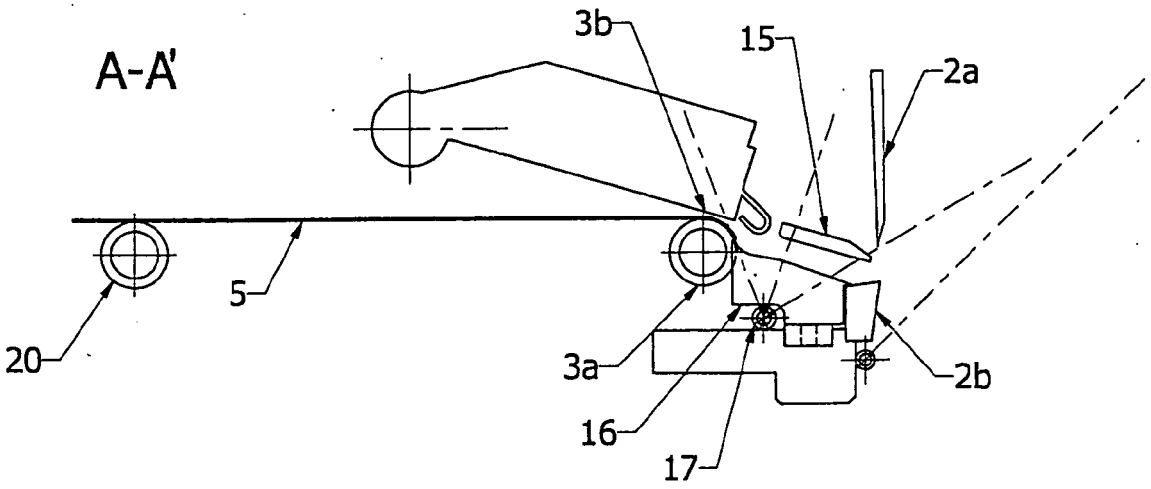


Fig.2b

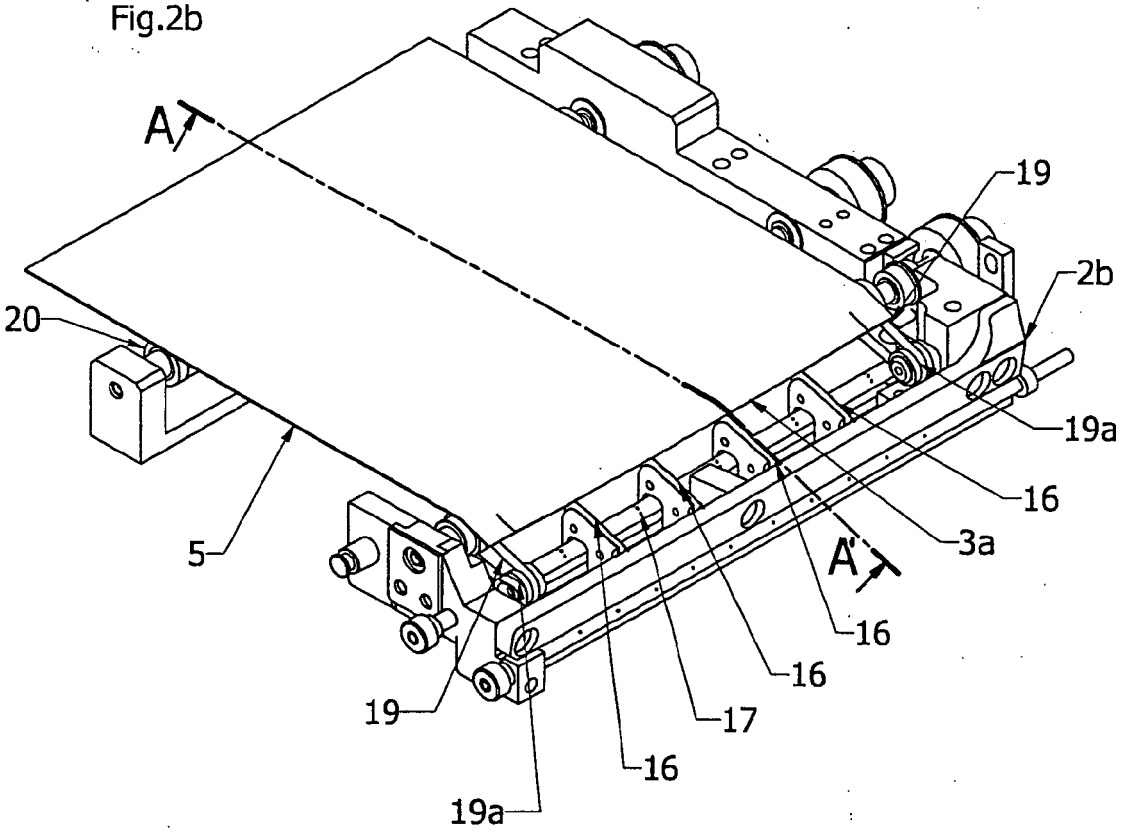


Fig.2

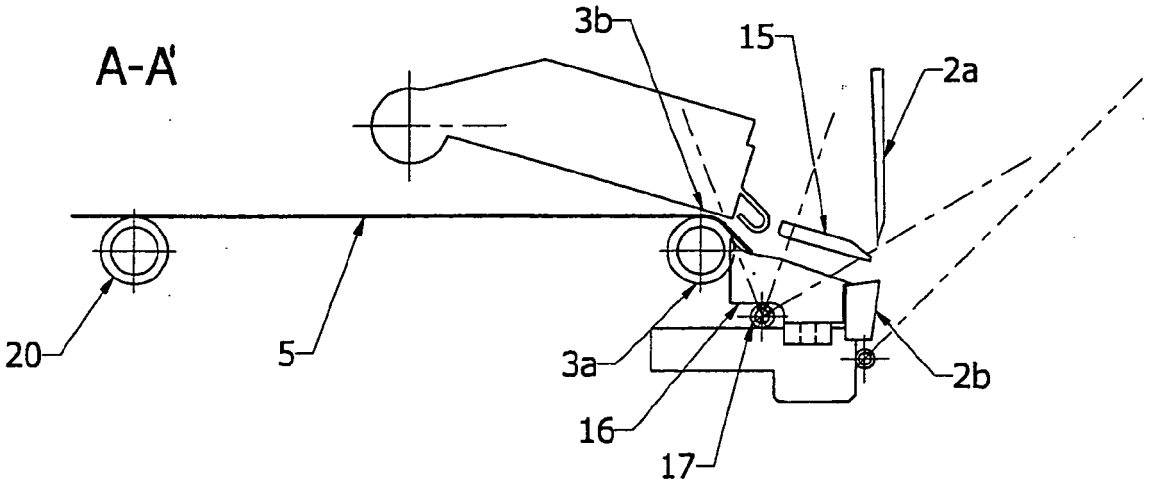


Fig.3b

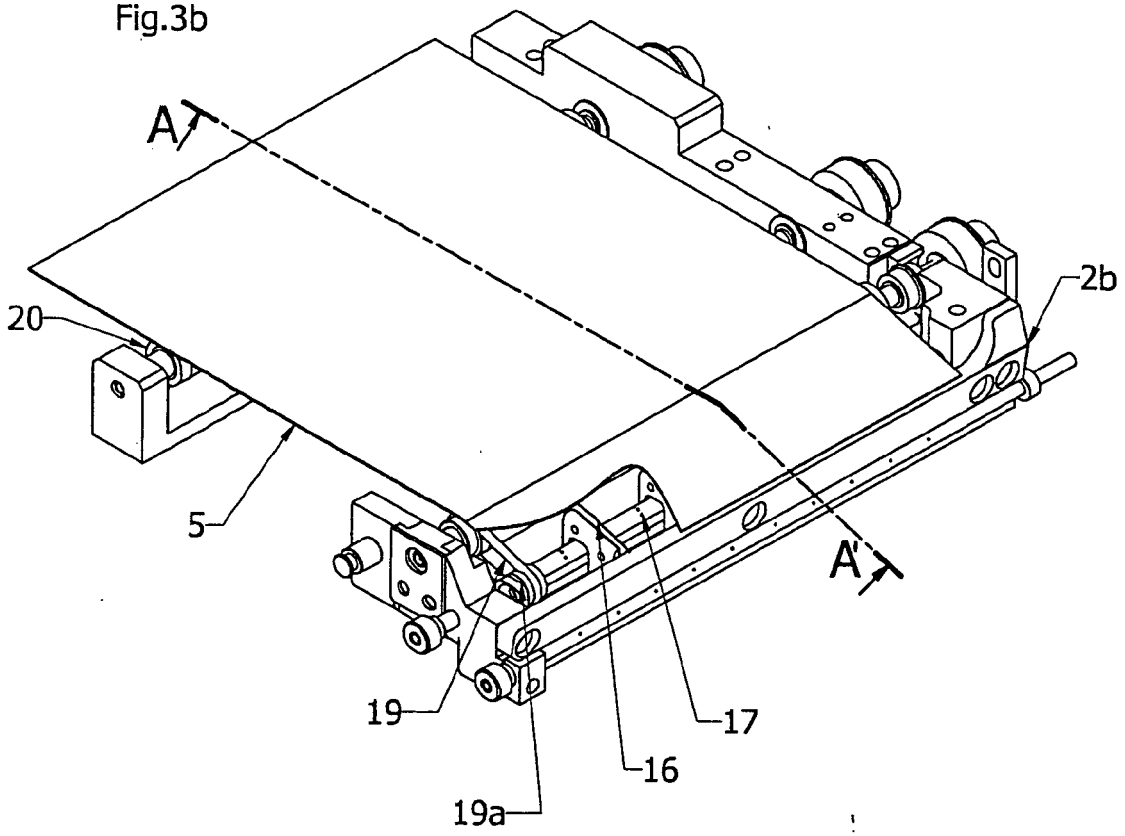
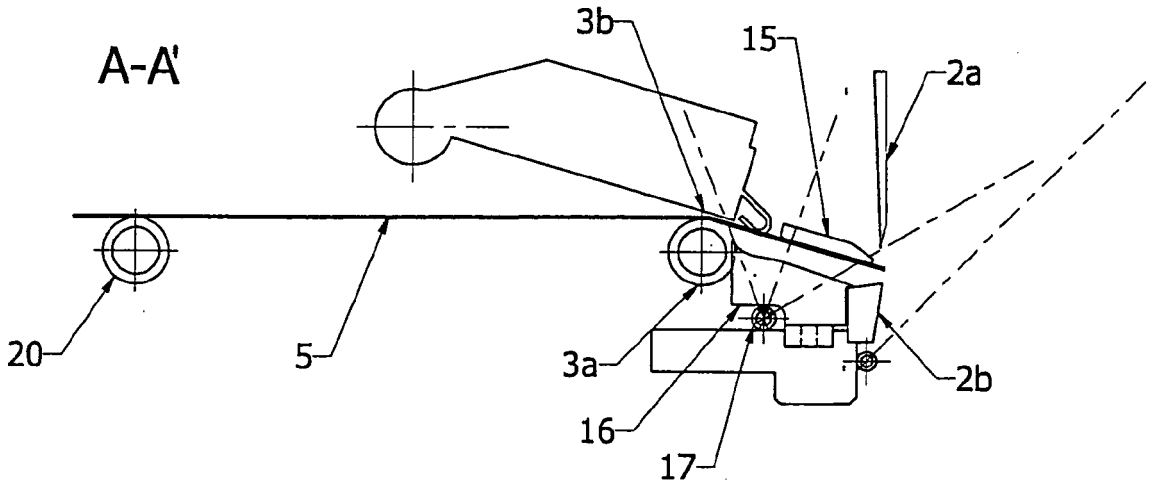


Fig.3



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EUROPEAN SEARCH REPORT

Application Number
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Place of search	Date of completion of the search	Examiner
The Hague	12 November 2008	Martínez Navarro, A

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