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## (54) Device for feeding articles in a roller dyeing machine

(57) A device (10) for inserting flexible sheet-like elements (14), particularly skins, in a blotting unit, comprising a conveyor belt (13) actuated by movement and guiding rollers (23) and an inker roller (16) which rotates in the opposite direction with respect to the advancement of the belt (13) and forms, together with the belt, a squeeze point through which the elements (14) are passed. The device comprising: a wedge-shaped plane (29), which is arranged so as to precede the inker roller (16); a contrast roller (31), which is parallel to the inker roller (16) and is arranged below the conveyor belt (13) so as to constitute a guiding element for the conveyor belt; and translatory motion means (33). The wedge-shaped plane constitutes a means for guiding the sheet-like elements in the squeeze point. At least one of the rollers that form the squeeze point is movable so as to widen the squeeze point.

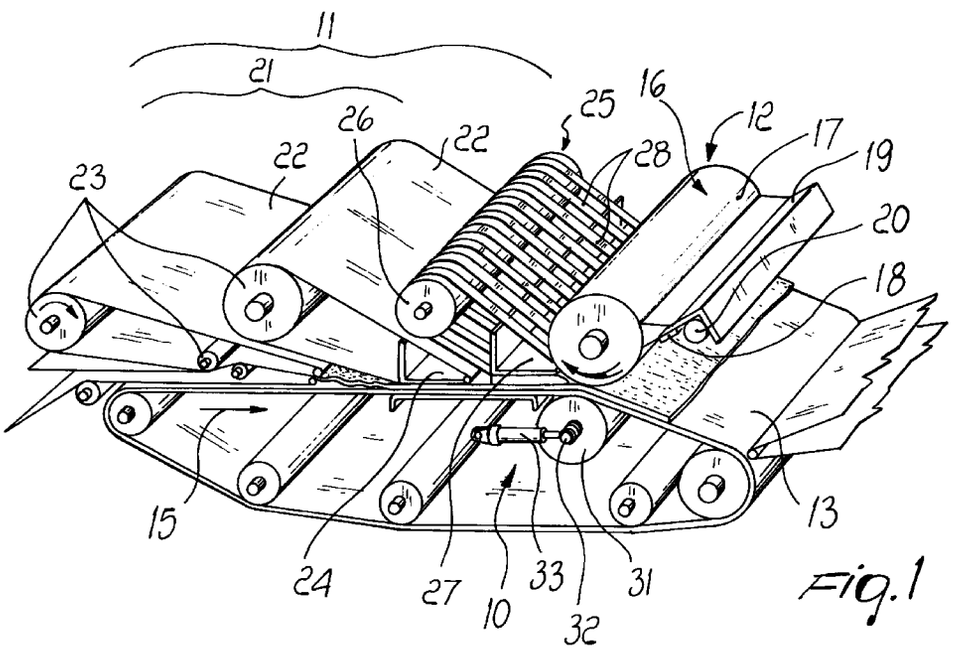


Fig. 1

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## Description

**[0001]** The present invention relates to a device for inserting flexible sheet-like elements, particularly skins, in a blotting unit.

**[0002]** It is well-known that skins must be finished by means of a blotting process in which the skins are placed on a conveyor belt and then passed through a squeezing point which is provided by means of a passage formed between an inker roller and a contrast support.

**[0003]** Said inker roller, usually having a suitably etched rolling surface, is spread with ink and rotates in the opposite direction with respect to the advancement of the skins along the belt, so that the provided blotting is particularly effective.

**[0004]** In particular, the inker roller is indispensable for treating skins with viscous liquids by means of which, for example, it is necessary to apply superficially a leather dye, a layer of color or size.

**[0005]** This kind of treatment, however, is affected by a severe drawback which occurs when the leading edges of the sheet-like elements to be finished are inserted.

**[0006]** When the sheet-like element carried by the belt makes contact with the surface of the inker roller, which rotates in the opposite direction, it rises and, due to the combined effect of advancement and rotation, rolls up and is no longer able to enter the squeezing point.

**[0007]** Sometimes, when the sheet-like element makes contact with the surface of the inker roller, it rises and folds back, forming one or more layers of skin folded through the squeeze point.

**[0008]** This drawback clearly affects the finishing result of the element due to the incorrect insertion of the leading edge in the squeeze point and compromises the operation of the blotting unit.

**[0009]** The greater force applied by the double layer of folded skin that passes through the squeeze point can in fact damage the actuation and retention devices of the components of the blotting unit and can lead to breakages and malfunctions due to these continuous and repeated stresses.

**[0010]** Currently devices are provided which use wedge-like bodies at the point of contact between the belt, supported by the contrast support, and the surface of the inker roller.

**[0011]** The wedge-shaped bodies cause the skins to be guided correctly at the squeeze point and allow them to make contact with the inker roller in a point which is as close as possible to the point of tangency between the conveyor belt and the roller.

**[0012]** The use of said wedge-shaped bodies accordingly reduces the possibility of lifting of the leading edges of the skins.

**[0013]** This technical solution, however, is not sufficient by itself to eliminate all problems; in any case, it contributes to an increase in the pressure in the squeeze point, worsening the stresses affecting the components.

**[0014]** Devices are currently being widely marketed which use, at the inker roller, a presser roller so as to form with said roller the squeeze point for the passage of the skins.

**[0015]** The presser roller rotates concordantly with the direction of advancement of the skins and is arranged so that the leading edges of the skins can make contact with its surface (facilitating their advancement) before encountering the etched surface of the inker roller, which rotates in the opposite direction.

**[0016]** With this technical refinement, the skins are pulled by the presser roller and should not lift when the surface of the inker roller, with which they make contact subsequently, begins the blotting treatment.

**[0017]** A further evolution that is currently being used entails combining the wedge-shaped plane, arranged so as to precede the passage formed by the squeeze point, with the device that uses the presser roller to make contact with the skins before contact with the inker roller in order to guide them correctly towards treatment.

**[0018]** In any case, all these constructive configurations have yielded rather limited results, since they are unable to fully eliminate the problem of the lifting and overlapping of the leading edges of the skins to be finished.

**[0019]** The aim of the present invention is to provide a device for inserting flexible sheet-like elements, particularly skins, in a blotting unit which solves the drawbacks described above in conventional types.

**[0020]** In relation to this aim, a particular object of the present invention is to provide a device for inserting flexible sheet-like elements in a blotting unit which is capable of eliminating any lifting of the leading edges.

**[0021]** Another important object of the present invention is to provide a device for inserting flexible sheet-like elements in a blotting unit which causes no additional stress to the components of said unit.

**[0022]** Another important object of the present invention is to provide a device for inserting flexible sheet-like elements in a blotting unit which allows to finish elements having a low thickness and a significant softness.

**[0023]** This aim, these objects and others which will become apparent hereinafter are achieved by a device for inserting flexible sheet-like elements in a blotting unit, comprising a conveyor belt actuated by movement and guiding rollers and an inker roller which rotates in the opposite direction with respect to the advancement of said belt and forms, together with said belt, a squeeze point through which said elements are passed, characterized in that it comprises: a wedge-shaped plane, which is arranged so as to precede said inker roller; a contrast roller, which is parallel to said inker roller and is arranged below said conveyor belt so as to constitute a guiding element for said conveyor belt; and translatory motion means; said wedge-shaped plane

constituting a means for guiding said sheet-like elements in said squeeze point, at least one of said rollers that form said squeeze point being movable so as to widen said squeeze point.

**[0024]** Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred embodiment thereof, illustrated only, by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a device for inserting flexible elements in a blotting unit, according to the invention, in the operating configuration;
Figure 2 is a side view of a detail of the device according to the invention in an open position;
Figure 3 is a side view of a detail of the device according to the invention, in a closed position;
Figure 4 is a side view of a detail of the device according to the invention in a different embodiment, in the open position;
Figure 5 is a side view of a detail of the device according to the invention in a different embodiment, in the closed position.

**[0025]** With reference to the above figures, a device for inserting sheet-like elements in a blotting unit, according to the invention, is generally designated by the reference numeral 10 and operates in combination with a conveyor unit 11 of a per se known type and with a blotting unit 12.

**[0026]** The blotting unit 12 comprises a conveyor belt 13 above which flexible sheet-like elements are arranged; in this case, said sheet-like elements are skins 14 which are conveyed towards an inker roller 16 in a direction, indicated schematically by the arrow 15, which is concordant with the direction of advancement of the conveyor belt 13.

**[0027]** The inker roller 16 is constituted by a cylinder which is arranged so that its main axis is perpendicular to the direction of advancement of the belt 13; the length of said cylinder corresponds to the transverse dimension of said belt 13.

**[0028]** The inker roller 16 also has an etched rolling surface 17 and rotates in the opposite direction with respect to the advancement of the belt 13, being actuated by movement elements which are not shown in the above figures and are of a per se known type.

**[0029]** Ink is spread on the rolling surface 17 of the inker roller 16 by means of a doctor 18 which is actuated in a per se known manner by an arm 19 supported by a shaft 20 which is parallel to the axis of the inker roller 16.

**[0030]** The conveyor unit 11 is provided with a first guiding unit 21 which is constituted, in this case, by two front and rear upper belts 22 actuated and guided by adjustment rollers 23 which are arranged along axes which are parallel to the inker roller 16 and follow and press the skins 14 against the conveyor belt 13.

**[0031]** In particular, the first guiding unit 21 is provided with a guide 24 which is interposed between one of the upper belts 22, has a structure which has an L-shaped cross-section, is substantially as long as the transverse dimension of the conveyor belt 13 and is parallel to the arrangement plane of the inker roller 16 so as to have a portion resting on the belt 13.

**[0032]** The guide 24 acts on the skins 14 conveyed by the belt 13, pressing and stretching them out thoroughly to facilitate their insertion in the squeeze point.

**[0033]** The upper belts 22 are actuated by adjustment means, not shown in the figures, of a per se known type, with a variable speed, by means of the rollers 23, which rotate in the same direction in which the belt 13 advances.

**[0034]** A second guiding unit 25 is arranged between the first guiding unit 21 and the inker roller 16 and comprises an actuation roller 26, a comb-shaped guide 27 and belts 28.

**[0035]** The comb-shaped guide 27 is also constituted by a structure which has an L-shaped cross-section, is as long as the transverse dimension of the conveyor belt 13, is parallel to the guide 24 and is meant, like the guide, to follow and stretch out the skins 14 before they are inserted in the squeeze point.

**[0036]** In particular, the portion that rests on the belt 13 is arranged so that the edge directed towards the inker roller 16 is comb-shaped.

**[0037]** The comb-shaped edge forms teeth between which the belts 28 for engaging the actuation roller 26 are arranged parallel to each other.

**[0038]** The movement roller 26 is parallel to the rollers 23 for adjusting the first guiding unit 22 and rotates in the same direction as said rollers, actuating the belts 28 arranged between the teeth of the comb-shaped guide 27.

**[0039]** A wedge-shaped plane 29 is arranged between the teeth of the comb-shaped guide 27 and the inker roller 16; said plane also is substantially as long as the transverse dimension of the conveyor belt 13 and has a cross-section which is substantially complementary to a portion of the rolling surface 17 of the inker roller 16.

**[0040]** The wedge-shaped plane 29 is interposed between the comb-shaped guide 27 and the inker roller 16 so that it is substantially covered by the latter and its very edge is proximate to the vertical plane 30, formed by the axis of said inker roller 16, which determines the point of tangency of said roller 16 with respect to the conveyor belt 13.

**[0041]** The wedge-shaped plane 29 acts as a barrier between the leading edges of the skins 14 and the inker roller 16.

**[0042]** In particular, a contrast roller 31 is arranged parallel to the inker roller 16 below the conveyor belt 13; the shaft 32 of said contrast roller is connected, at its ends, to horizontal fluid-driven cylinders 33 for the horizontal movement of said contrast roller 31.

**[0043]** The squeeze point through which the conveyor

belt 13 is passed is formed between the inker roller 16, which rotates in the opposite direction with respect to the advancement of the belt 13, and the contrast roller 31.

**[0044]** The fluid-driven cylinders 33 are capable of moving the contrast roller 31 horizontally with respect to its shaft 32.

**[0045]** The operation of the device 10 entails placing the skins 14 on the conveyor belt 13 so that they advance, in the advancement direction indicated by the arrow 15, towards the inker roller 16.

**[0046]** The skins 14 are pressed and thoroughly stretched out on the conveyor belt 13 by means of the first and second guiding units 21 and 25.

**[0047]** The contrast roller 31 is instead suitable to be moved from an open position to a closed position.

**[0048]** When a skin 14 conveyed by the belt 13 and accompanied by the upper belts 22 is properly pressed by the guide 24 and by the comb-shaped guide 27 and moves towards the blotting unit 12, the contrast roller 31 is in the open position, i.e., it is actuated by the fluid-driven cylinders 33 and is moved horizontally into a position, designated by the reference numeral 34 in the above figures, so as to precede the inker roller 16.

**[0049]** In this position, the distance between the conveyor roller 13 and the inker roller 16 is greater than the thickness of the skin 14 to be finished.

**[0050]** When the skin 14, protected by the wedge-shaped plane 29, is at the vertical plane 30 of the inker roller 16, the contrast roller 31 begins to gradually reduce the gap to the optimum distance for excellent finishing.

**[0051]** The contrast roller 31 thus reaches a final closed position when the leading edge of the skin 14 has moved beyond the vertical plane 30 of the inker roller 16, avoiding the risk of being repelled by it and of being lifted and folded back.

**[0052]** As an alternative, a different open position of the contrast roller 31 is reached if the shaft 32 is actuated by the vertical cylindrical stems 34.

**[0053]** In a constructive variation, the shaft 32 of the contrast roller 31 is connected to the ends of vertical fluid-driven cylinders to provide its vertical movement.

**[0054]** In this constructive solution, when the leading edge of a skin 14 is inserted in the squeeze point, the shaft 32 lies on the vertical plane 30 and the contrast roller 31 is lowered to allow the leading edge of the skin 14 to easily access the squeeze point until it makes contact with the inker roller 16 at said vertical plane 30.

**[0055]** Once it has moved beyond the vertical plane 30, the contrast roller 31 gradually returns to the closed position.

**[0056]** In a second embodiment, shown schematically in Figures 4 and 5, a device for inserting sheet-like elements in a blotting unit comprises an inker roller, designated by the reference numeral 116, also having a rolling surface 117 which is etched and spread with ink by a doctor, of a per se known type, not shown in the above figures.

**[0057]** The inker roller 116 forms, in combination with a contrast roller 131 and with a conveyor belt 113, which are substantially equivalent to the contrast roller 31 and to the conveyor belt 13 described earlier, a squeeze point through which the sheet-like elements, for example skins 14, are to be passed for blotting.

**[0058]** A wedge-shaped plane 129, fully similar to the previous plane 29 described earlier, is arranged so as to precede the inker roller 116 to facilitate the insertion of the skins 14 in the squeeze point.

**[0059]** In this embodiment, the shaft of the inker roller 116 is connected, at its ends, to translatory motion means, for example fluid-driven cylinders of the above described type not shown in Figures 4 and 5, for moving the inker roller 116.

**[0060]** In particular, the fluid-driven cylinders are capable of moving the inker roller 116 in a direction, indicated schematically by the arrow 134, so that said inker roller 116 can arrange itself in an open position, in which the distance between the conveyor belt 113 and the inker roller 116 is greater than the thickness of the skins 14.

**[0061]** Then, when the leading edges of the skins 14 are at the vertical plane 130 of the inker roller 116, said inker roller starts to move gradually to a closed position for restoring the squeeze point, until the optimum distance from the inker roller 113 is reached so as to achieve excellent finishing of the skins 14.

**[0062]** In practice, the described configuration is fully equivalent to the preceding ones.

**[0063]** In practice, it has been observed that the present invention fully achieves the aim and all of the intended objects.

**[0064]** In particular, an important advantage is achieved with the present invention by providing a device for inserting flexible sheet-like elements in a blotting unit which avoids the danger of being repelled by said device and of lifting and folding back the leading edges of said elements.

**[0065]** Another important advantage is achieved with the present invention by providing a device for inserting flexible sheet-like elements in a blotting unit causing no additional stress to the components of said unit.

**[0066]** Another important advantage is achieved with the present invention by providing a device for inserting flexible sheet-like elements in a blotting unit which can be used to finish elements having a limited thickness and significant softness.

**[0067]** The device for inserting flexible sheet-like elements in a blotting unit according to the present invention is capable, in particular, of finishing elements having different characteristics, allowing to use automatic lines composed of multiple units, arranged conveniently with respect to each other, and no longer requiring operators to continuously feed each unit.

**[0068]** The present invention is susceptible of numerous modifications and variations, all of which are within

the scope of the same inventive concept.

**[0069]** All the details may also be replaced with other technically equivalent elements.

**[0070]** The materials employed, as well as the dimensions, may be any according to requirements.

**[0071]** Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. A device for inserting flexible sheet-like elements in a blotting unit, comprising a conveyor belt actuated by movement and guiding rollers and an inker roller which rotates in the opposite direction with respect to the advancement of said belt and forms, together with said belt, a squeeze point through which said elements are passed, characterized in that it comprises: a wedge-shaped plane, which is arranged so as to precede said inker roller; a contrast roller, which is parallel to said inker roller and is arranged below said conveyor belt so as to constitute a guiding element for said conveyor belt; and translatory motion means; said wedge-shaped plane constituting a means for guiding said sheet-like elements in said squeeze point, at least one of said rollers that form said squeeze point being movable so as to widen said squeeze point.

2. A device according to claim 1, characterized in that said movable roller is the contrast roller and is connected to said translatory motion means, which adjust its movement from an open position for widening said squeeze point to a closed position for restoring said squeeze point.

3. A device according to claim 1, characterized in that said movable roller is the inker roller, which is connected to said translatory motion means which adjust its movement from an open position for widening said squeeze point to a closed position for restoring said squeeze point.

4. A device according to claim 2, characterized in that said open position is achieved by means of a translatory motion of said contrast roller, adjusted by said translatory motion means, in the opposite direction with respect to the advancement of said belt, said translatory motion widening said squeeze point for the insertion of leading edges of said elements.

5. A device according to claim 4, characterized in that said translatory motion means are fluid-driven cylinders which are arranged in the direction of advancement of said conveyor belt, are provided with stems connected to the ends of said contrast roller and are suitable to move it.

6. A device according to claim 2, characterized in that said open position is achieved by means of a translatory motion of said contrast roller, adjusted by said translatory motion means, so as to lower said contrast roller and widen said squeeze point for the insertion of leading edges of said elements.

7. A device according to claim 6, characterized in that said translatory motion means are fluid-driven cylinders which are arranged at right angles to said conveyor belt and are provided with stems which are connected to the ends of said contrast roller and are suitable to move it.

8. A device according to claim 3, characterized in that said open position is achieved by raising said inker roller by means of said translatory motion means so as to widen said squeeze point.

9. A device according to claim 1, characterized in that said wedge-shaped plane is shaped complementarily to a portion of the rolling surface of said inker roller, said wedge-shaped plane being located below said inker roller so as to precede its point of tangency with the conveyor belt with respect to the advancement direction of said conveyor belt.

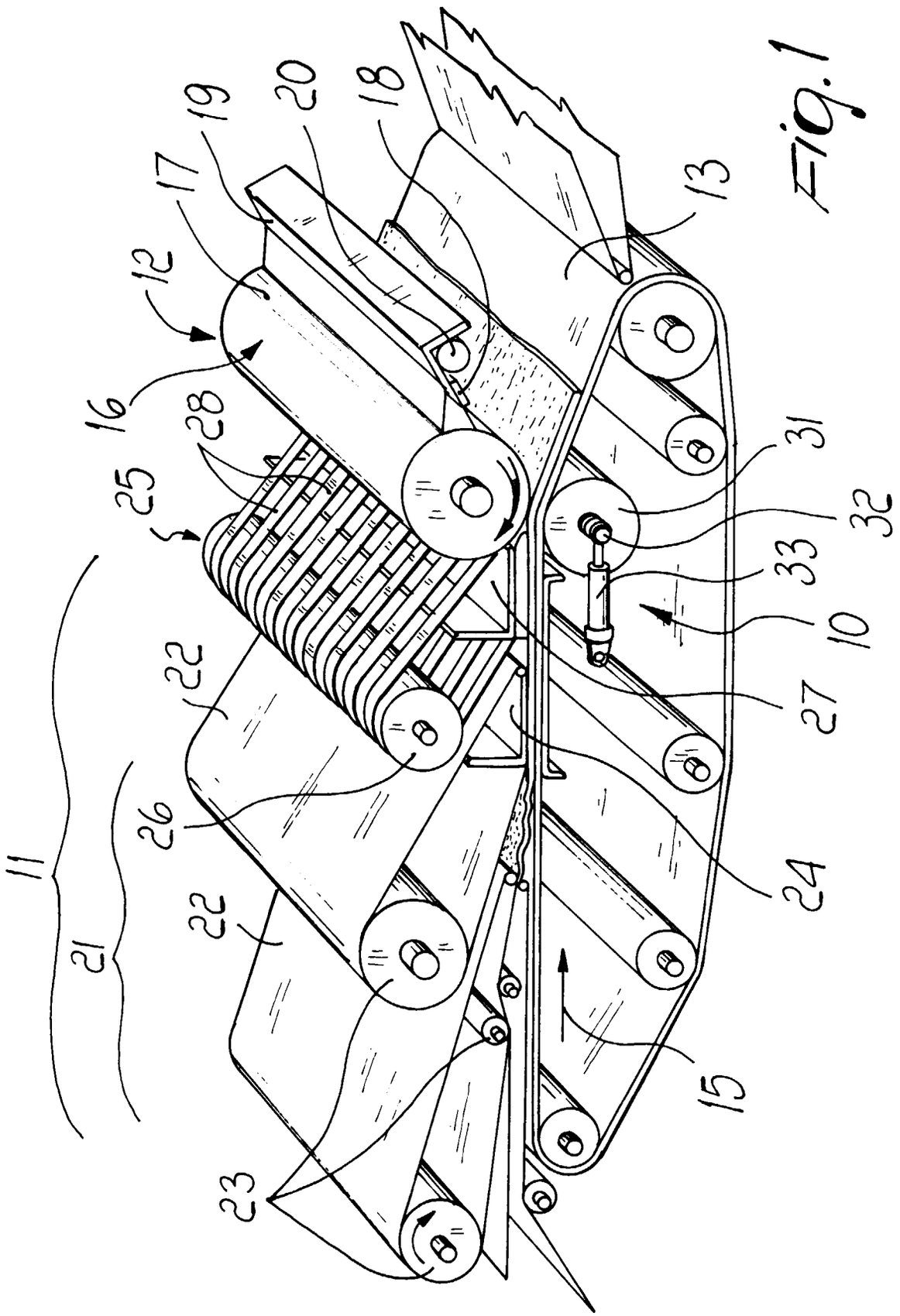


Fig. 1

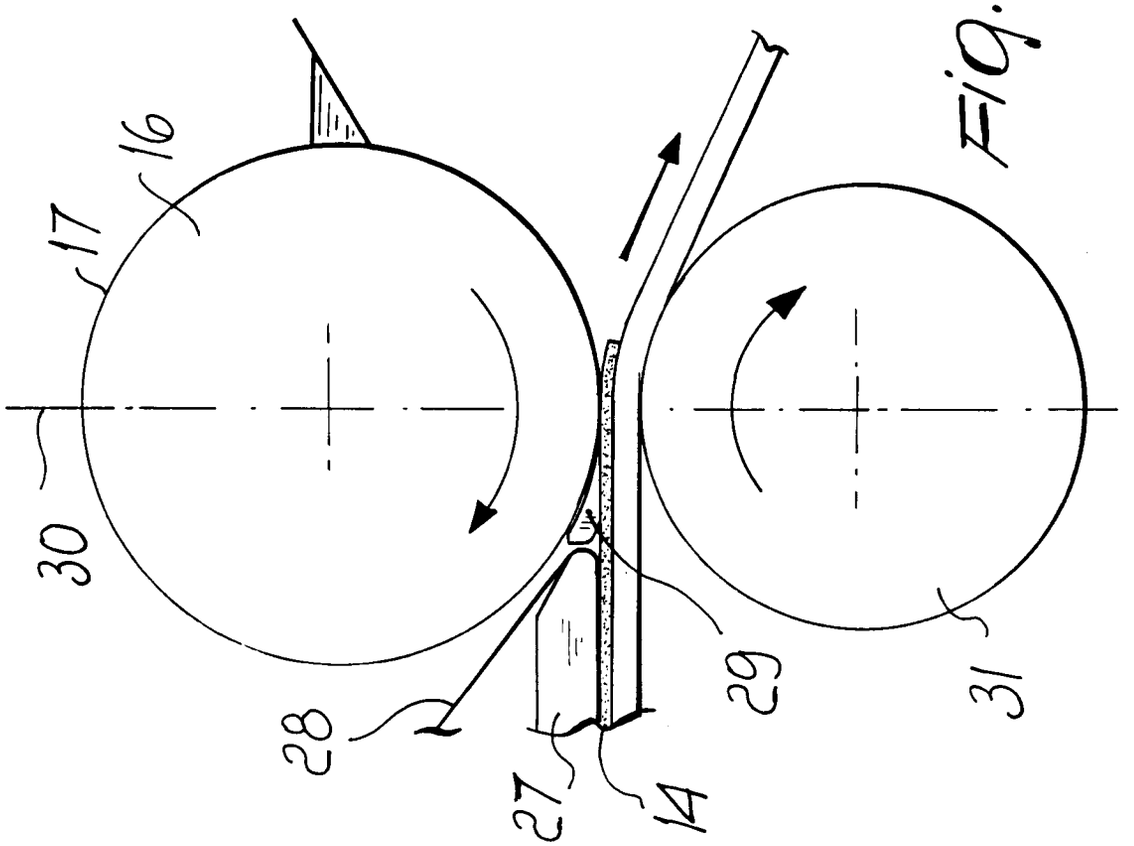


Fig. 3

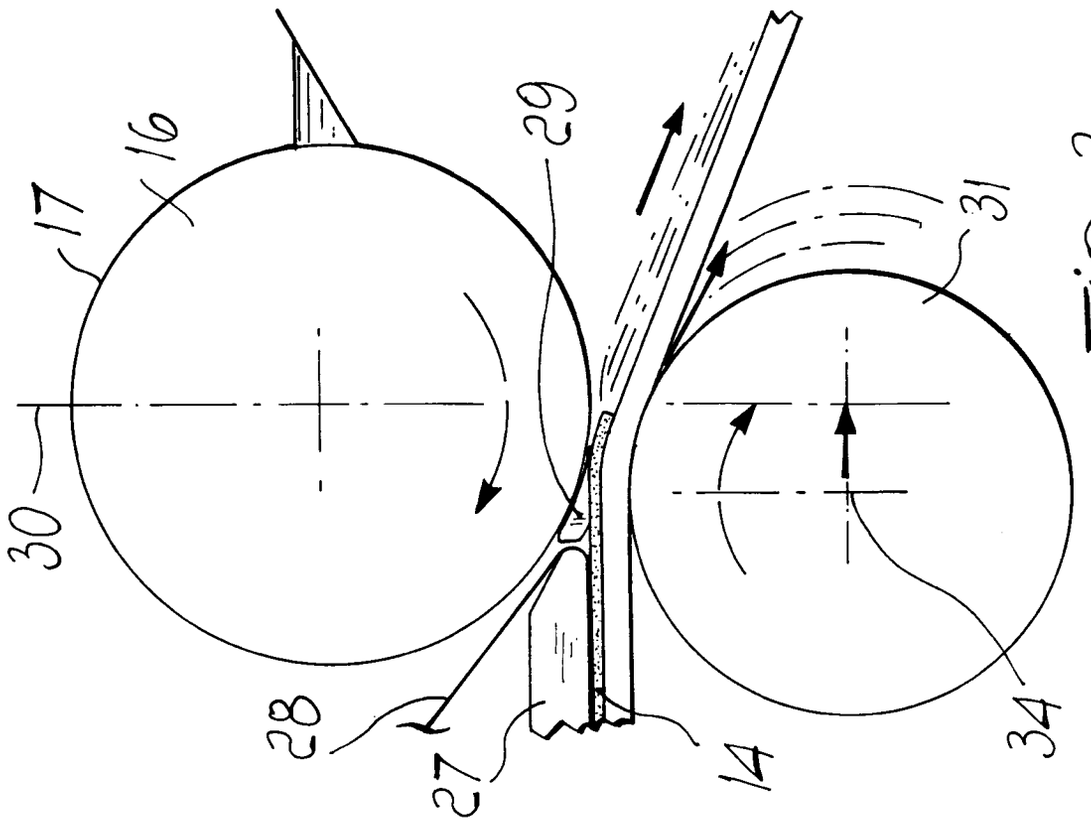


Fig. 2

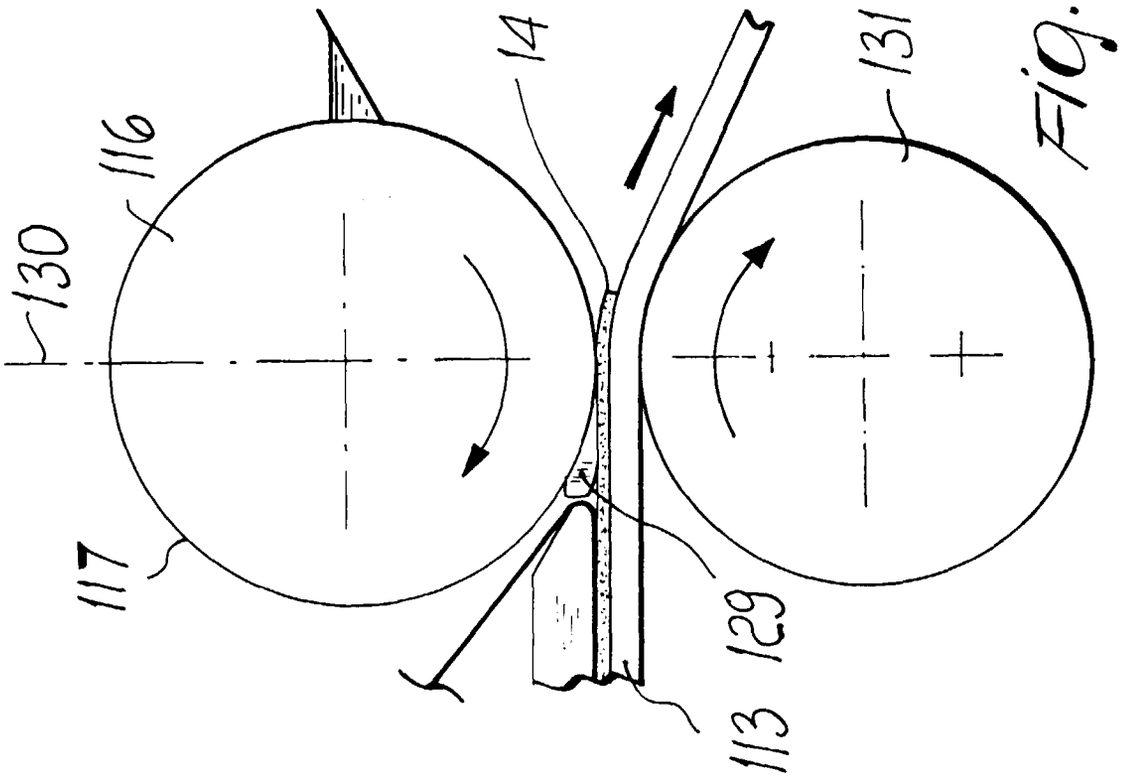


Fig. 5

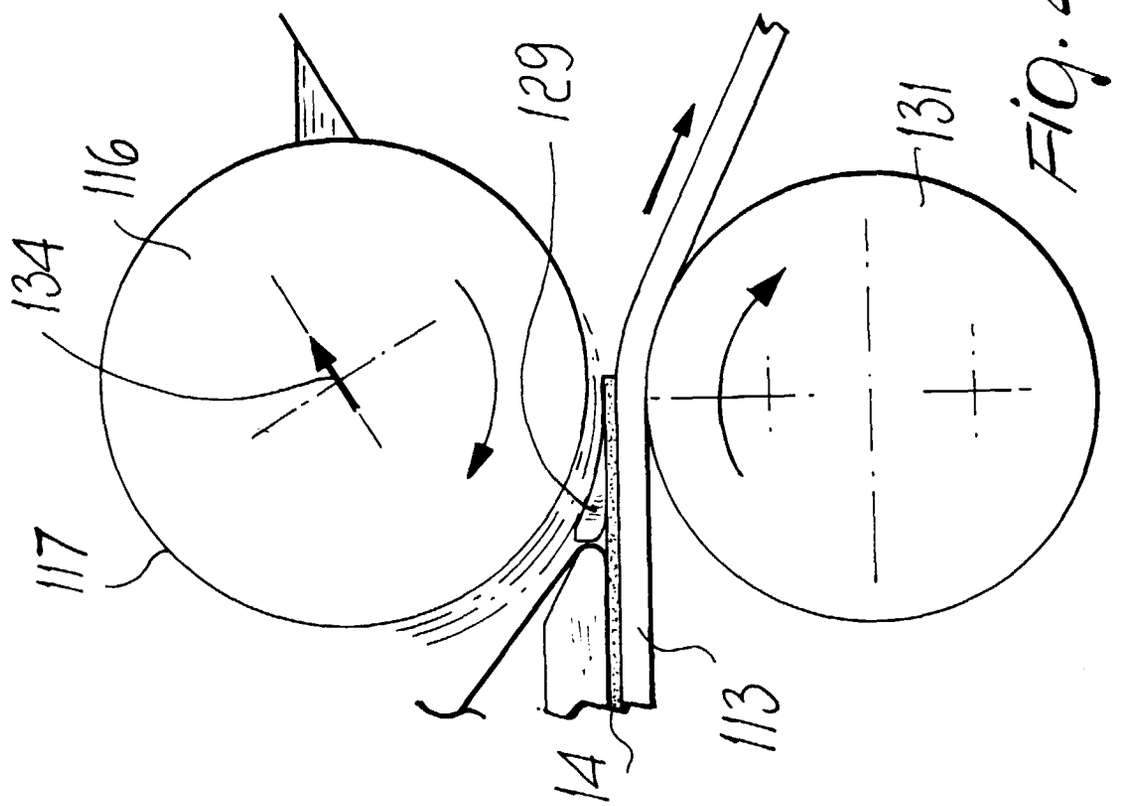


Fig. 4

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 98 11 0513

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
| X | EP 0 484 740 A (CARTIGLIANO OFF SPA) 13 May 1992<br>* abstract; figures *<br>* column 3, line 31 - column 5, line 46 * | 1,2,6,9 | C14B17/06 |
| A | WO 96 26294 A (ELITAS S N C DI BELLUZZI LINO ;BELLUZZI LINO (IT)) 29 August 1996<br>* abstract; figures *<br>* page 5, line 24 - page 6, line 11 * | 1,9 | |
| A | DE 94 00 543 U (GE MA TA SPA) 3 March 1994<br>* page 7, line 17 - page 10, line 2; figures * | 2-8 | |

| TECHNICAL FIELDS SEARCHED (Int.Cl.6) |
|---|
| C14B<br>C14C |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 10 November 1998 | Helpiö, T. |

CATEGORY OF CITED DOCUMENTS

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