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(54) **Apparatus for wrapping a lollipop**

(57) Apparatus for wrapping a lollipop in a single-twist wrapping. The apparatus is provided with a holder for a lollipop (2), which holder is continuously rotatable around a first axis (5) and is axially movable to and fro, a stationary curve path, a pair of folding plates (3,4) being continuously rotatable, synchronously with the lollipop holder around the axis, of which folding plates a first one (4) is connected via a lever (12) to a curve roll (11) which contacts the curve path (10), the folding plates defining both a folding opening and being, by the shape of the curve path, movable relative to each other to increase and reduce the folding opening, and with an apparatus for feeding wrapping material between the folding plates and the lollipop holder and for cutting the wrapping material. The apparatus is further provided with means for reducing, during feeding of the wrapping material between the folding plates and the lollipop holder, the relative speed between the folding plates and the wrapping material fed by the feeding apparatus and for reducing, during movement of the lollipop holder in the direction towards the folding plates, the relative speed between the lollipop holder and the piece of cut-off wrapping material.

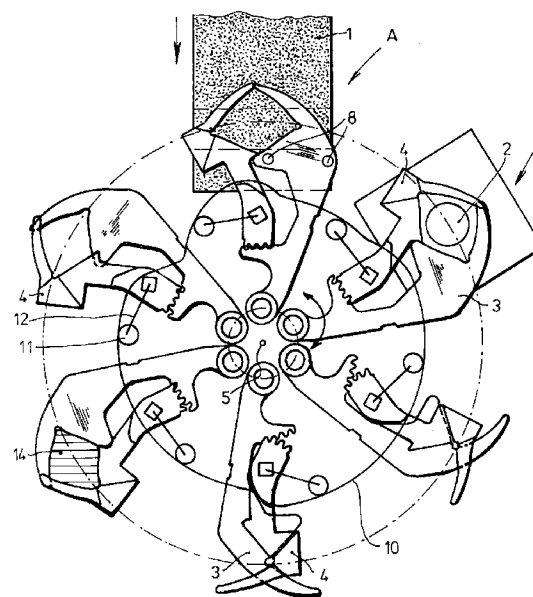


FIG.1

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Description

The invention relates to an apparatus for wrapping a lollipop in a single-twist wrapping, said apparatus being provided with a holder for a lollipop, which holder is continuously rotatable around a first axis and is axially movable to and fro, a stationary curve path, a pair of folding plates being continuously rotatable, synchronously with the lollipop holder around a second axis being in line with the first axis, of which folding plates a first one is connected via a lever to a curve roll which contacts the curve path, the folding plates defining both a folding opening and being, by the shape of the curve path, movable relative to each other in order to increase and reduce the folding opening, with an apparatus for feeding wrapping material between the folding plates and the lollipop holder and for cutting the wrapping material, and with a twisting apparatus, placed opposite the lollipop holder on the side of the folding plates, which twisting apparatus is continuously rotatable synchronously with the lollipop holder, around a third axis being in line with the first axis, for twisting the end of the wrapping material round the lollipop stick, in which a lollipop can be brought by the lollipop holder against the wrapping material, through the folding opening and into the twisting apparatus.

Such an apparatus has been in use for a considerable period of time. In order to wrap a lollipop by means of this apparatus, the lollipop is moved by the lollipop holder in the direction of the folding plates, during which the lollipop takes along a cut-off piece of wrapping material in the direction of movement of the lollipop. The head of the lollipop is moved through the folding opening of the folding plates, as a consequence of which the wrapping material is folded around the head of the lollipop. At the moment at which the head of the lollipop has completely passed the folding plates, the folding opening is reduced by cooperation between the curve roll and the curve path, as a consequence of which the wrapping material is folded further around the head of the lollipop. The single-twist wrapping is subsequently finished in that a twisting apparatus twists the ends of the wrapping material around the stick of the lollipop. Because the feeding apparatus feeds the wrapping material radially, moving of the lollipop will at a certain moment cause the wrapping material to be clamped between the head of the lollipop and the folding plates and to be taken along in the rotating movement of the lollipop and the folding plates. However, the size of the lollipops is not always exactly the same, so that the moment of cutting the piece of wrapping material and bringing the lollipop towards the folding plates is no longer synchronized, as a result of which the moment of clamping of the wrapping material between the head of the lollipop and the folding plates is not always the same. The wrapping material will consequently not always be positioned accurately relative to the lollipop. Due to this, the wrapping cannot be sealed sufficiently around the stick, which negatively affects the storage life of the lollipop, and in printed wrapping material with a print which is repeated on each separate lollipop,

the print may not be positioned sufficiently reproducibly relative to the lollipops.

It is an object of the present invention to provide an apparatus for wrapping a lollipop in a single-twist wrapping, in which the wrapping material can be positioned sufficiently reproducibly relative to the lollipop and the lollipop can be sufficiently closed by the wrapping material.

To this end, an apparatus is provided of the type mentioned in the preamble, characterized according to the invention in that the apparatus is provided with means for reducing, during feeding of the wrapping material between the folding plates and the lollipop holder, the relative speed between the folding plates and the wrapping material fed by the feeding apparatus and for reducing, during movement of the lollipop holder in the direction of the folding plates, the relative speed between the lollipop holder and the piece of cut-off wrapping material. The invention is based on the insight that a reduction of this difference in speed allows for a more accurate positioning of the lollipop relative to the wrapping material and that furthermore the chance of the wrapping material tearing is reduced. The smaller this difference in speed, the more accurate the positioning.

A preferred embodiment of an apparatus according to the invention is characterized in that the means comprise a grab jaw mounted on the second folding plate for grasping a cut-off piece of wrapping material and a curve path having such a shape that the second folding plate, during feeding of the wrapping material between the folding plates and the lollipop holder, is moved contrary to the rotational movement of the lollipop holder, in which the contrary movement is preferably as big as the rotational movement. In this way, the existing apparatus can be simply and inexpensively modified in such a way that the wrapping material is stationary relative to the lollipop when the lollipop is moved towards the folding plates. Due to this, an extremely precise and reproducible positioning of the wrapping material relative to the lollipop can be realized.

The grab jaw is preferably formed in a simple but efficiently mechanically manner by two cams and a clamping element that can be placed against them, which clamping element, in order to reproducibly provide a clamping force on the wrapping material, is preferably a V-shaped leaf spring.

Some exemplary embodiments of an apparatus for wrapping a lollipop in a single-twist wrapping will hereafter be described, by way of example, with reference to the drawing, in which:

figure 1 shows a schematic view of an apparatus according to the invention,

figure 2 shows a schematic section of a part of the apparatus according to figure 1, and

figures 3 and 4 each show the relative position of two pairs of folding plates in a different angle position of the apparatus.

Figure 1 shows a schematic view, and figure 2 shows a schematic section, of an apparatus for wrapping a lollipop in a single-twist wrapping. The apparatus is provided with a known holder, not shown, for a lollipop 2, 18. The holder with lollipop 2, 18 is continuously rotatable around a first axis 5 and axially movable to and fro. The apparatus further comprises a number of pairs of folding plates 3, 4, being rotatable synchronously with the lollipop holder around a second axis 5, being in line with the first axis. One first folding plate 4 of each pair is connected via a lever 12 to a curve roll 11, which curve roll contacts a curve path 10 and runs over it. The second folding plate 3 is connected via a rack to the first folding plate 4. Each pair of folding plates 3, 4 forms a folding opening 14. Due to the shape of the curve path 10, when the curve roll 11 runs over the curve path 10, the folding plates 3, 4 will move towards and away from each other, by which the folding opening 14 can be increased or reduced as desired.

The apparatus also comprises a known feeding apparatus, not shown, for feeding the wrapping material 1 between a pair of folding plates 3, 4 and the lollipop 2, 18 in the lollipop holder. This feeding apparatus is also provided with a cutting apparatus for cutting a piece of wrapping material at the desired size.

Up until now, wrapping a lollipop in a single-twist wrapping, in which the lollipop holder and the pair of folding plates are driven continuously, was done as follows.

The wrapping material 1 is placed by the feeding apparatus between the lollipop 2, 18 in the lollipop holder and the pair of folding plates 3, 4. Due to the cooperation between the curve path 10 and the curve roll 11, the mutual position of the folding plates 3, 4 is herein such, that the folding opening 14 is maximum. The lollipop 2, 18 is subsequently moved by the lollipop holder against the wrapping material 1, at which same time a piece of wrapping material is cut off and the lollipop 2, 18 is moved on up to and through the folding opening 14 between the folding plates 3, 4. Hereby, the wrapping material is taken along by the head 2 of the lollipop and, when the head of the lollipop 2 is located beyond the folding plates 3, 4, the piece of wrapping material will be folded partially around the head of the lollipop 2. At the moment at which the head of the lollipop 2 is located beyond the folding plates 3, 4, rotation of the lollipop holder and the pair of folding plates 3, 4 has brought the curve roll 11 in such a position of the curve path 10 in which the folding plates 3, 4 move towards each other, thereby reducing the folding opening 14, as a consequence of which the piece of wrapping material is folded further around the head of the lollipop. The reduction of the folding opening 14 continues until the lollipop stick 18 is clamped by the folding plates 3, 4. At this moment, the head of the lollipop 2 is located in a twisting apparatus 17 which is rotatable synchronously with the lollipop

holder around a third axis 5 being in line with the first axis and which finishes the single-twist wrapping by twisting the ends of the piece of wrapping material with a twisting movement around the lollipop stick 18. After this, cooperation of the curve roll 11 and the curve path 10 increases the folding opening 14 so that the lollipop holder can retract the wrapped lollipop through the folding plates and can deliver it for further processing.

Because the wrapping takes place during the continuous rotation of the lollipop holder and the pair of folding plates 3, 4, at a given time the wrapping material 1 will be clamped between the head of the lollipop 2 and the pair of folding plates 3, 4 and be taken along in the rotating movement. However, because the size of the lollipops is not always exactly the same, cutting off of the wrapping material and the movement do not always take place synchronously. Due to this, the wrapping material 1 is not positioned reproducibly relative to the lollipop and clamping of the wrapping material against the folding plates takes place in an undefined manner. This can cause the wrapping material to be torn and can result in incorrectly wrapped lollipops. This problem increases as the production speed, that is to say the rotational speed, increases.

The invention solves this problem by providing means for reducing, during feeding of the wrapping material between the folding plates and the lollipop holder, the relative speed between the folding plates and the wrapping material fed by the feeding apparatus and for reducing, during movement of the lollipop holder in the direction of the folding plates, the relative speed between the lollipop holder and the piece of cut-off wrapping material. The relative speed is preferably reduced to zero. In this way the lollipop, regardless of its size, will always take up the same position relative to the wrapping material during the pressing of the wrapping material against the folding plates. An additional advantage is that the production speed can be significantly increased, even by a factor of 2 or more, without problems occurring.

The means can for instance be formed by a separate member which rotates a cut-off piece of wrapping material synchronously with the lollipop holder around an axis which is in line with the first axis, as a result of which the lollipop is stationary relative to this wrapping material when the lollipop is placed against the wrapping material.

However, the means are preferably formed, on the one hand, by such a shape of the curve path 10 that the second folding plate 3, during feeding of the wrapping material 1 between the folding plates 3, 4 and the lollipop holder, is moved contrary to the rotational movement of the lollipop holder, the result being that the second folding plate is stationary during the relevant time relative to the wrapping material. On the other hand, the means are formed by a grab jaw 7, 8 mounted on the second folding plate 3 for grasping a cut-off piece of wrapping material, so that a piece of wrapping material can be cut off and grasped without negatively affecting the positioning in the period between the cutting off and the grasping. Because the first folding plate 4 is coupled to the second

folding plate 3 by a rack connection, the first folding plate 4, during grasping of the wrapping material 1 by the grab jaw 7, 8, will be accelerated in the direction of the normal rotational movement. The folding opening 14 is hereby therefore reduced. It will be clear that the lollipop holder presses the lollipop 2, 18 against the wrapping material only after grasping the wrapping material, that is to say when both folding plates 3, 4 once again rotate synchronously with the lollipop holder. This is indicated in figure 1, in which in position A the wrapping material 1 is cut off and grasped and in position B the lollipop is moved towards the folding plates. These means allow for an existing wrapping apparatus to be simply yet efficiently adapted in an inexpensive manner in order to solve the problems described above.

The grab jaw is preferably formed by two cams 8 and a clamping element 7 placed against them, in which the clamping element 7 only presses the piece of wrapping material against the cams 8 during the necessary time. A reproducible clamping is obtained when the clamping element is formed by a V-shaped leaf spring 7.

The inventive means for reducing the relative speed between the second folding plate 3 and the wrapping material cause the second folding plate, during the movement of the lollipop holder towards the pair of folding plates 3, 4, to be stationary relative to the wrapping material as is shown schematically in figures 3 and 4. Figure 3 shows the position in which the pair of folding plates 3, 4 has just reached the vertical position, that is to say the position parallel to the line 6. The feeding apparatus has brought the wrapping material up to the desired position. At this moment, the wrapping material has not yet been clamped. Although the other pairs of folding plates, such as for instance the pair of folding plates 3', 4' continue to rotate, the second folding plate 3 will remain in the vertical position due to cooperation of the curve roll and the curve path. The rack connection will cause the first folding plate 4 to move towards the second folding plate 3 at an accelerated pace. This gives sufficient time to cut off a piece of wrapping material 1' and clamp it in the grab jaw 7, 8. At this moment, the pair of folding plates 3', 4' has come closer to the second folding plate 3, as becomes clear from figure 4. Hereafter, all pairs of folding plates continue their normal rotation, as a consequence of which the lollipop can be moved towards the wrapping material and is finally wrapped correctly.

Claims

1. Apparatus for wrapping a lollipop in a single-twist wrapping, said apparatus being provided with a holder for a lollipop, which holder is continuously rotatable around a first axis and is axially movable to and fro, a stationary curve path, a pair of folding plates being continuously rotatable, synchronously with the lollipop holder around a second axis being in line with the first axis, of which folding plates a first one is connected via a lever to a curve roll which

contacts the curve path, the folding plates defining both a folding opening and being, by the shape of the curve path, movable relative to each other in order to increase and reduce the folding opening, with an apparatus for feeding wrapping material between the folding plates and the lollipop holder and for cutting the wrapping material, and with a twisting apparatus, placed opposite the lollipop holder on the side of the folding plates, which twisting apparatus is continuously rotatable synchronously with the lollipop holder, around a third axis being in line with the first axis, for twisting the end of the wrapping material round the lollipop stick, in which a lollipop can be brought by the lollipop holder against the wrapping material, through the folding opening and into the twisting apparatus, **characterized in that** the apparatus is provided with means for reducing, during feeding of the wrapping material between the folding plates and the lollipop holder, the relative speed between the folding plates and the wrapping material fed by the feeding apparatus and for reducing, during movement of the lollipop holder in the direction of the folding plates, the relative speed between the lollipop holder and the piece of cut-off wrapping material.

2. Apparatus according to claim 1, **characterized in that** the means comprise a grab jaw mounted on the second folding plate for grasping a cut-off piece of wrapping material and a curve path having such a shape, that during movement of the lollipop holder in the direction towards the folding plates, the folding plates are moved contrary to the rotational movement of the lollipop holder.
3. Apparatus according to claim 2, **characterized in that** the grab jaw is formed by two cams and a clamping element that can be placed against them.
4. Apparatus according to claim 3, **characterized in that** the clamping element is a V-shaped leaf spring.

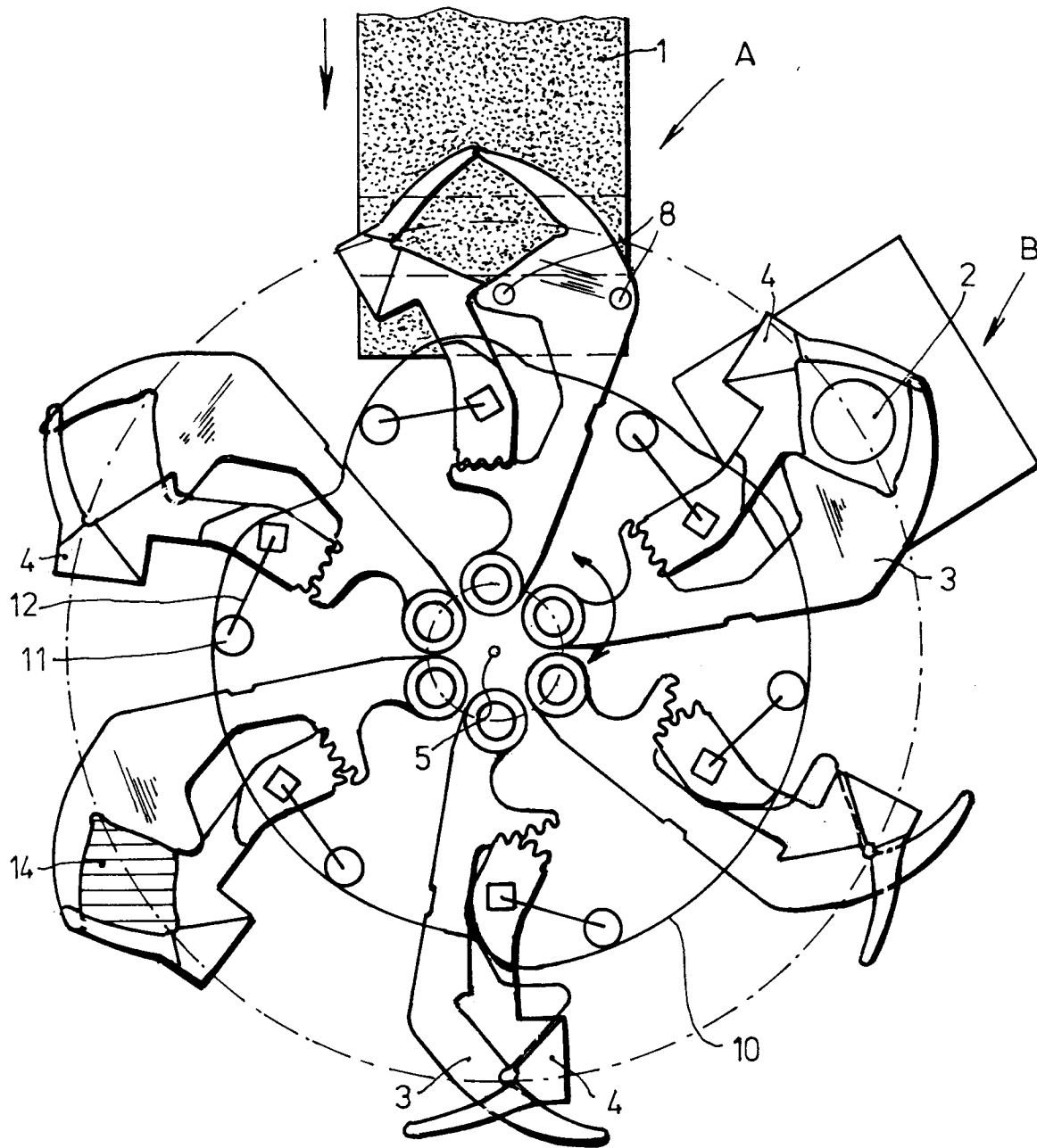


FIG.1

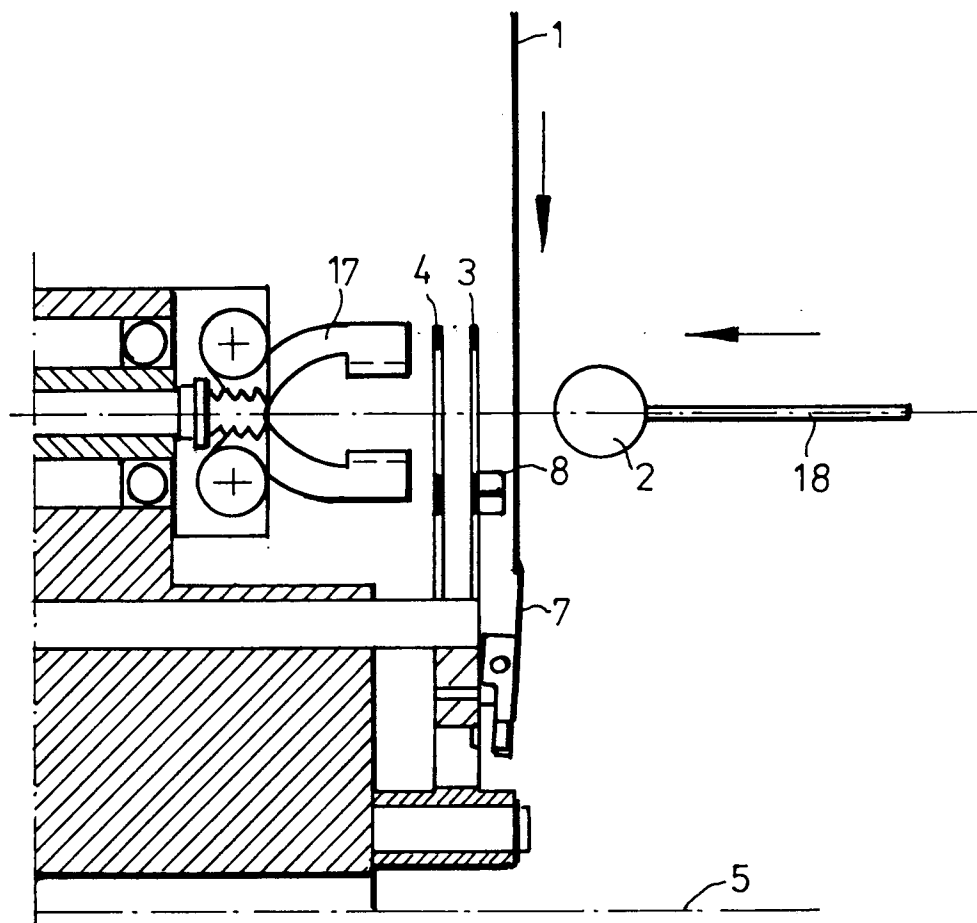
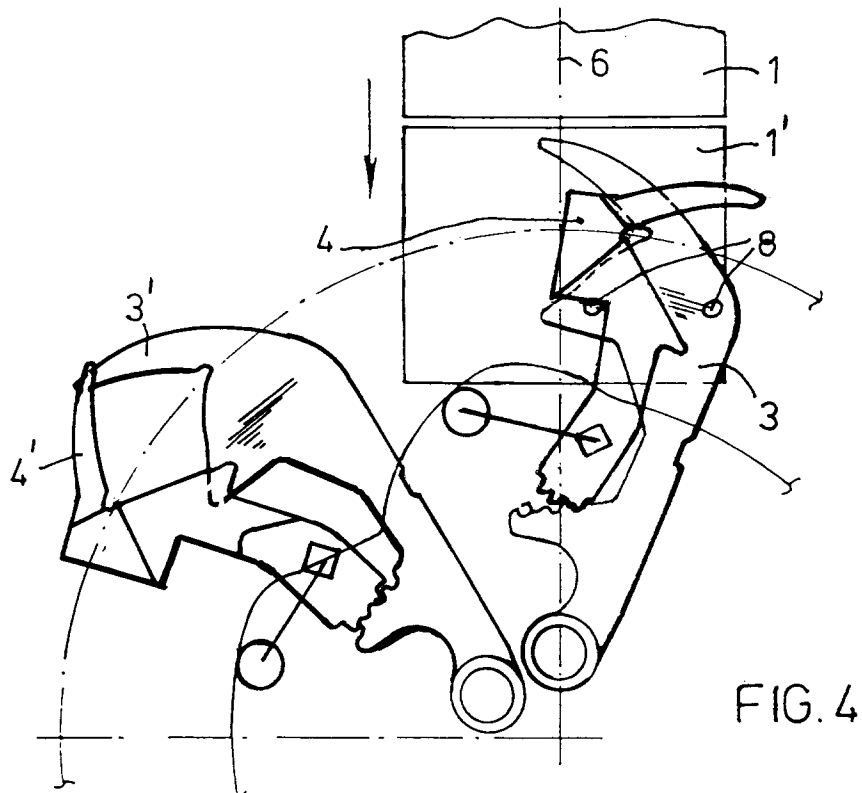
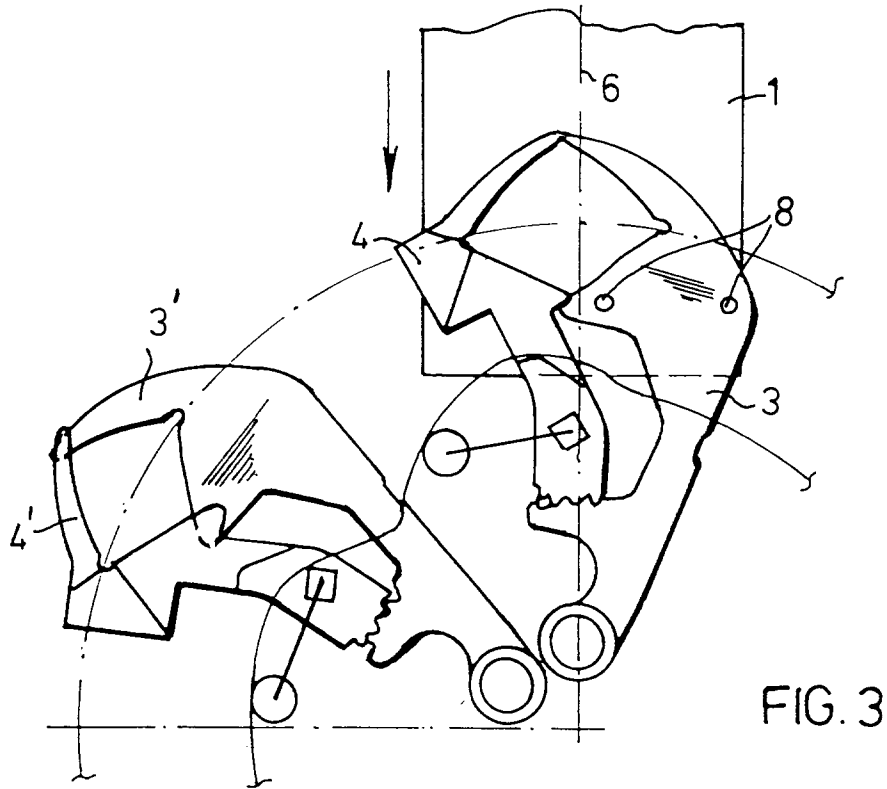


FIG. 2





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EUROPEAN SEARCH REPORT

Application Number
EP 95 20 3374

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)
A	FR-A-1 198 891 (FORGROVE) 10 December 1959 * page 2, column 1, line 24 - column 2, line 37; figure 1 *	1	B65B11/54
A	US-A-2 872 768 (SHEPLER) 10 February 1959 -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 March 1996	Examiner Claeys, H
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