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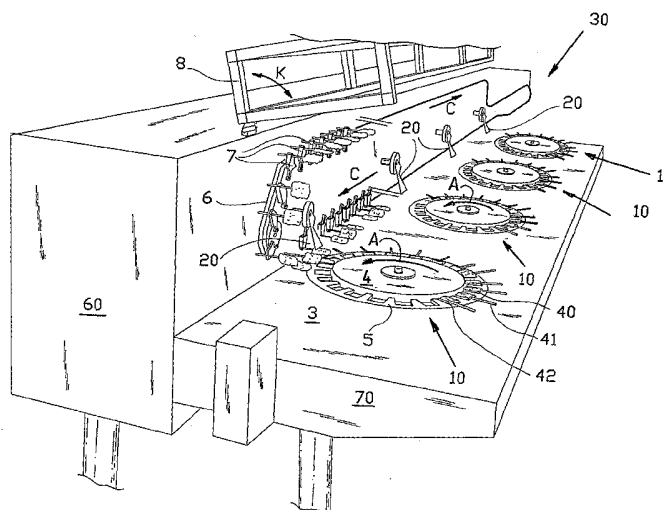
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(54) Title: PACKAGING MACHINE



(57) Abstract: Device for packaging products (60), provide with a head and stick (41), such as lollipops comprising a packaging station (30), for packaging the products in packaging material, such as foil, a supply conveyor (6) for supplying the products to the packaging station, wherein the supply conveyor (6) is provided with a series product holders positioned one after the other in conveyance direction, and a feed station comprises having means for singled supply to the supply conveyor, wherein the feed station comprises at least one feed conveyor provided with accommodating spaces for each time a head of a product and placed for conveyance of the products to a transfer station (20) for transfer of the products to the supply conveyor, wherein the feed station furthermore comprises a spreading table extending adjacent to the feed conveyor and forming a working surface for an operator.



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### Packaging machine

The invention relates to a device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil.

- 5 It is known to package such products in between two layers of foil, that are supplied in webs and are sealed together by two cooperating sealing rollers, while enclosing the head and a consecutive part of the stick. This may particularly regard lollipops having a non-round, particularly flat cross-section of the head. After sealing the packaged products are separated from each  
10 other by a pair of blade rollers.

The packaging station may be connected via a supply conveyor to a station in which the products are made. After production, the products are then immediately and automatically transferred in singled condition to the  
15 packaging station.

The packaging station and the production station may also be spaced apart, such as for instance is the case with products, such as lollipops, that are passed through a cooling device after production. The products are then  
20 supplied in bulk to the packaging station. They may then be supplied to an assembly of a spreading disc and distribution disc via a feed chute, wherein, at its circumference, the distribution disc is provided with accommodation holes for the heads of the products, wherein the stick is able to extend

radially to the outside. The spreading disc, driven in a direction opposite to the direction of the distribution disc, ensures spreading of the products that have ended up on the spreading disc, so that as many accommodation holes as possible will be filled. There are stationary guides below the  
5 circumferential edge of the distribution disc to ensure that the heads of the products remain in the correct position in the accommodation holes.

The distribution disc takes the products to a transfer station where they are transferred to the clamping holders that are disposed on a circulating  
10 conveyor chain that passes the products through/along the packaging station.

There is group of products provided with a head and stick that may easily get damaged, and therefore have to be treated with care. Such products, for  
15 example chocolate lollipops, may not be suitable for a continuous production/packaging.

Such fragile products are supplied in bulk to the packaging station, and then manually placed one by one, in the clamping holders of a supply conveyor.  
20 The supply conveyor has to circulate at a low speed in order to make a correct manual placement of the products possible. This means, however, that the packaging frequency is low as well.

It is an object of the invention to improve on this.  
25

Another object of the invention is to provide a packaging machine for products provided with a head and stick, such as lollipops, wherein the products are manually fed and yet a high packaging frequency can be achieved.

30 A further object of the invention is to provide a packaging machine for products provided with a head and stick, such as lollipops, wherein the

products enter the packaging station with their heads in the correct orientation.

For achieving at least one of these objects the invention provides a device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided with a series product holders positioned one after the other in conveyance direction, and a feed station having means for singled supply to the supply conveyor, wherein the feed station comprises at least one feed conveyor provided with accommodation spaces for each time accommodating a head of a product and placed for conveyance of the products to a transfer station for transfer of the products to the supply conveyor, wherein the feed station furthermore comprises, a preferably stationary, spreading table extending adjacent to the feed conveyor and forming a working surface for an operator.

As a result the operator is able to bring the products, which, supported on the spreading table, lie ready, into the accommodation spaces with an overview. This action is simple and as a result may be carried out without problems, also with fragile products. It may even be possible that alternatingly, consecutively, first a product is placed with the one hand and then subsequently a next product with the other hand. The actually placing of the products in the holders is carried out by the feed conveyor and the transfer station, that means automatically.

Preferably the spreading table extends along several sides of the feed conveyor, particularly along both sides. Thus the time the operator is able to insert the heads of the products into the accommodation spaces is prolonged.

Preferably the feed conveyor comprises a disc that is rotatable about a

vertical axis, which disc is provided with the accommodation spaces at its circumference. Such a disc offers the operator a proper overview. The circulating path followed by the accommodation spaces offers the operator ample opportunity to correctly place the products with their heads in the accommodation spaces, according to an uninterrupted series.

Preferably the spreading table is situated connecting to the circumference of the disc.

10 In an advantageous embodiment the disc has parts forming bottoms of the accommodation spaces. As a result the heads of products are conveyed free from frictional forces along guides placed underneath the accommodation spaces, as a result of which the risk of damaging the head is reduced. A further advantage is that when the operator extends his/her fingers into the accommodation space, those fingers cannot end up between fixed and rotating parts.

Yet it may be advantageous that the bottom are provided with local passages, so that grit and the like may fall out of the accommodation space and does not hamper the next products.

Preferably the feed conveyor forms a top surface in which the accommodations spaces have been formed and which is situated at substantially the same level as the surface of the spreading table. The operator is able to bring the products in the accommodation spaces, practically without picking them up, for instance by sliding them. This advantage is increased if the top surface is situated at the same level or slightly below the surface of the spreading table.

30 With the set-up according to the invention, a further increased frequency can be achieved when it comprises a number of feed conveyors that are placed functionally parallel, adjacent to each other. Several operators are thus able

to feed for the same supply conveyor.

Preferably each feed conveyor of the device has its own transfer station, wherein the transfer stations are spaced apart along the supply conveyor.

- 5 The feeding into the supply conveyor is thus spread, and as a result less failure prone.

- It is preferred here that the device further comprises first means for driving the feed conveyor and second means for driving the supply conveyor, wherein the first driving means drive the feed conveyor at a speed that is  $1/(\text{number of feed conveyors}) \times \text{the speed of the supply conveyor}$ .
- 10

- In one embodiment the transfer station is provided with means for operating the product holders on the supply conveyor for bringing them in a receiving position, and with means for activating the operation means at a frequency equalling the speed of the feed conveyor in question.
- 15

- It is preferred here that the device furthermore comprises orienting means for orienting the head of the product into the product holder in a plane perpendicular to the stick. In this way it is achieved that the heads are always uniformly oriented when entering the packaging station, as a result of which the packaging itself can always take place under the same conditions. The heads preferably are oriented parallel to the path of movement of the product holders, particularly horizontally.
- 20

25

When the orienting means are part of the transfer station, the orienting can take place when the product holders are not yet (fully) closed and do not prevent some rotation of the stick.

- 30 Preferably the orienting means comprise an orienting plate comprising an orienting surface situated in the path of the head of a product engaged by a product holder.

If the orienting means are movable together with the said operation means for the product holders, they will be able to remain out of reach of the movement path of the heads of products that have already been placed in product holders elsewhere earlier on.

From a further aspect the invention provides a device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided with a series of product holders positioned one after the other in conveyance direction, and a feed station having means for singled supply to the supply conveyor, wherein the feed station comprises at least one feed conveyor provided with accommodation spaces for each time accommodating a head of a product and placed for conveyance of the products to a transfer station for transfer of the products to the supply conveyor, wherein the device comprises a number of feed conveyors that are placed functionally parallel.

Thus a very high frequency can be achieved even in case of manual insertion in the feed conveyor. Several operators are then able to feed for the same supply conveyor.

Preferably each feed conveyor of the device comprises its own transfer station, wherein the transfer stations are spaced apart along the supply conveyor. The feeding into the supply conveyor is thus spread, and as a result less failure prone.

Preferably the device comprises first means for driving the feed conveyor and second means for driving the supply conveyor, wherein the first driving means drive the feed conveyor at a speed that is  $1/(\text{number of feed conveyors}) \times \text{the speed of the supply conveyor}$ .

In one embodiment the transfer station is provided with means for operating the product holders on the supply conveyor for bringing them in a receiving position, and with means for activating the operation means at a frequency  
5 equalling the speed of the feed conveyor in question.

The feed conveyors may comprise discs that are rotatable about a vertical axis, which discs are provided with the accommodation spaces at their circumference. Each disc may have parts forming bottoms of the accom-  
10 modation spaces, the bottoms preferably being provided with local passages, so that the bottoms are partially open.

From a further aspect the invention provides a circular disc provided with a series of accommodation spaces for the heads of lollipops and suchlike  
15 products provided with a head and stick, wherein the disc has parts forming bottoms of the accommodations spaces, wherein the bottoms preferably are provided with local passages.

It is a further object of the invention to provide products provided with a  
20 head and stick that are packaged between two sheets of packaging material, that can easily be opened.

From a further aspect the invention provides a device for packaging products provided with a head and stick, such as lollipops, comprising a packaging  
25 station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided with a series of product holders positioned one after the other in conveyance direction, wherein the packaging station comprises a pair of cooperating sealing rollers, a first and a second supply for  
30 supplying a first and a second web of packaging material to the sealing rollers, where the webs are sealed together, enclosing at least the head of the product, and a pair of cooperating blade rollers for separating the

packaged products, wherein the supply conveyor is placed for conveying the products confined between both packaging webs, in between the sealing rollers and the blade rollers, wherein the pair of blade rollers is provided with additional cutting means for forming an incision in the packaging. Without  
5 adding an extra station the packaged product can thus be provided with an option for easy-opening.

Preferably the additional cutting means are placed for forming an incision extending from the edge of the packaging, so that the opening is already  
10 initiated.

Preferably the additional cutting means are situated at the side of the head facing way from the stick, so that opening is facilitated.

15 From a further aspect the invention provides a device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided with a series product holders positioned one  
20 after the other in conveyance direction, and a feed station having means for singled supply to the supply conveyor, wherein the feed station comprises at least one feed conveyor provided with accommodation spaces for each time accommodating a head of a product and placed for conveyance of the products to a transfer station for transfer of the products to the supply  
25 conveyor, further comprising orienting means for orienting the head of the product when transferring it into the product holder in a plane perpendicular to the stick. Thus it is achieved that the heads are always substantially uniformly oriented when entering the packaging station, as a result of which the packaging itself can always take place under the same conditions. The  
30 heads are preferably oriented parallel to the path of movement of the product holders, particularly at least substantially horizontally.

Preferably the orienting means are positioned for engaging the head prior to actual transfer to the product holder has taken place. The orienting means may be a part of the transfer station. In these cases the orienting may take place when the product holders do not prevent some rotation of the stick.

5

Preferably the orienting means comprise an orienting surface that is situated in the path of the head of the product when transferring it into the product holder. The orienting surface can thus easily extend according to a path that is parallel to the path of the product holders.

10

In a simple embodiment the orienting surface is formed by an edge, preferably an edge of a plate.

15

Preferably the orienting means comprise an orienting plate, comprising an orienting surface that is situated in the path of the head of a product engaged by a product holder.

20

The invention will be elucidated on the basis of an exemplary embodiment shown in the attached drawings, in which:

Figure 1 shows a view in perspective of an exemplary embodiment of a device according to the invention;

25

Figure 2 shows a front view of the packaging station of the invention according to claim 1;

Figure 3 shows a front view of a feed station in the device of figure 1;

30

Figures 4A, 4B show front views of a transfer station in the device of figure 1, in operational and non-operational condition, respectively;

Figure 5 shows a schematic top view of the transfer station of figures 4A,B;

Figures 6A and 6B show a head orienting part in the transfer station of figures 4A,B and 5 in front view and side view, respectively;

- 5 Figure 7 shows a view in perspective of blade rollers of the packaging station of the device of figure 1;

Figures 7A,B show a detail of the incision maker on the blade rollers of figure 7 and a detail of a blade intended for said blade roller, respectively; and

10

Figure 8 shows a group of lollipops packaged with the device of figure 1.

The packaging device 1 shown in figure 1 comprises a frame 2 having a casing 60 and a horizontal table 70 extending from it to the fore, at the long  
15 side of which, on the right-hand side as considered in the drawing, there is room for an operator.

The table 70 has a horizontal, flat working surface 3, in which circular holes 5 have been left open in which in this example four feed discs 4 rotating in  
20 the direction A have been fittingly placed.

At the location of the transition between the table 70 and the casing 60 a transfer station 20, that is further shown in the figures 3-5, is present for each of the four feed discs 4. It is observed that in figure 5 the parts in  
25 conveyance direction C have been moved apart for reasons of clarity.

A chain conveyor 6 circulates over and past the transfer stations 20, which chain conveyor 6 is provided with a series of stick clamps 7 that are known per se. The chain 6 circulates in the direction C, that means in the lower path  
30 from right to left and in the upper path from left to right, and consecutively according to a downward path to the packaging station 30 shown in figure 2. The conveyor 6 may be partially covered by means of a hood 8, shown in

the open position in figure 1 and which can be lowered in the direction K, after which the transfer stations 20 and the conveyor 6 are shielded from the hands of the operators that are in front of the table 70.

- 5 By means of operation means that are not further shown the speed or frequency of the feed stations 10, particularly the feed discs 4, the transfer station 20 and the speed of the chain 6 are adapted to each other.

- As can be seen in figure 2 the conveyor 6 leads to the packaging station 30.
- 10 The upper course of the chain 6, moving in the direction C, then inclines downward in the direction E, in order to subsequently run further horizontally in the direction F between a pair of sealing rollers 32a, 32b and a pair of blade rollers 33a, 33b. According to figure 2 the chain is shielded by plates 60, leaving a slit 61 through which sticks 41 of the lollipops 40, that are
- 15 held with their sticks 41 in the clamps 7, are able to extend, with the heads 42 within the treatment area of the sealing rollers 32a,b and blade rollers 33a,b.

- The packaging station 30 is provided with an upper stock roll 31 of
- 20 packaging foil 50a and a lower stock roll 31b of packaging foil 50b, wherein the foil webs 50a, 50b are discharged in the directions G, in order to coincide with the path of the lollipop heads 42, directly upstream of the sealing rollers 32a, b. Such a packaging station 30 is known per se, but as will be discussed further, the blade rollers 33a, b have an additional cutting
- 25 facility.

- The feed disc 4 of the feed station 10 comprises an elevated part 11 situated in the middle and an edge area 12, in which accommodation spaces 13 have been provided. These accommodation spaces 13 have a bottom
- 30 supporting the lollipop head, which bottom is provided with local holes 14, through which residues or grit of lollipop material is able to leave downward. Radially outside the accommodation spaces 13 the circumferential edge 12 is

provided with radial slits 15, in which the sticks 41 of the lollipops 40 are able to fit. As can be seen in figure 3 the lollipop heads 42 almost snugly fit into the accommodation spaces 13. The feed disc 4 may be adapted to the shape/size of the heads of the lollipops to be made. To that end the disc 4 is  
5 removably disposed in the table 70 by means of a bolt 16.

It can furthermore be seen in figures 1 and 3 that the working surface 3 of the table 70 fluently changes into the surface of the circumferential area 12. Operators may thus have the lollipops spread on the surface 3, and then  
10 manually engage the lollipops 40 by the stick 41 and slide them with their heads 42 into the accommodation spaces 13, thus guided by the working surface 3. Because the feed disc 4 is almost fully surrounded by the working surface 3 this may easily take place from various sides.

15 The transfer station 20 is situated at the side of the feed disc 4 opposite the operator, which transfer station, as can be seen in figure 4A, B, is provided with a driven transfer disc 21 rotating about a horizontal axis of rotation, which disc is provided with a notch 22 at diametrically opposite sides for accommodation of a stick 41. In figure 4A the level of the working surface 3  
20 is shown. A stick 41 is lifted from the feed disc 4 at a position of approximately "two thirty" by the notch 22, which has a trailing edge 22a that extends beyond the leading edge 22b -for facilitating the receipt of the stick 41-. For radial outward guidance a iron hoop plate 23 is provided, having curved guide edge 24 that ends at approximately "one o'clock" in  
25 edge end 24a. As can be seen in the top view of figure 5 the transfer disc 21 is designed double, having discs 21a,b. In the same manner the iron hoop plate 23 is designed double, having iron hoop plates 23a,b which engage at both sides of the transfer plate set 21a,b. A stick 41 is therefore always stably held during rotation of the transfer disc 21.

30

For confining the stick 41 in radial outward direction, after said stick has passed beyond the edge end 24a, a double arm 25 is attached on the iron

hoop plate 23, which double arm is rotatable in the directions H, about axis 25d, but is spring-biased in a direction H which is downward considered in the plane of the drawing.

5 The double arm 25 is provided with stop arm members 25a, which for limitation of the motion of the lever 25 about a permanent stop 29. As considered in the drawing, the long arm members 25b extend toward the left beyond the edge end 24a, and extend with arm end 25c to just beyond the "twelve o'clock" position near the top position of the recess 22, as shown in  
10 figure 4A. Thus during the movement of the recess 22, with the stick 41 accommodated in it, the stick 41 is still kept confined in the path between edge end 24a and the said "twelve o'clock" position.

In the figures 4A,B it can be seen that the conveyor chain 6, on which the  
15 clamps 7 have been attached, moves in the direction C according to a path tangential to the discs 21. It can be seen here that the stick clamps 7, in the known manner, have been built up from a fixed clamp member 8, that means a clamp member that is fixedly attached on the chain 6, and a movable clamp member 9, that is rotatably attached to permanent clamp member 8,  
20 and by means of a spring is biased to a closed clamp position. The clamp member 9 extends to above the chain 6 with operation end 9a, which in the situation as shown in figure 4A would about the circumferential edge of operation roller 26 having circumferential surface 26b in order to be rotated when passing along it, for opening the clamp opening between the clamp  
25 members 8 and 9. This happens just downstream of the edge end 24a of the edge 24. In the path after that the clamp member end 9a will be released from the roller 26, and the clamp opening will be closed. The clamp opening is fully closed in the "twelve o'clock" position, where the long arm member 25 also ends. The stick 41 is then fully clamped in the stick clamp 7, so that  
30 further conveyance in the direction C, in the drawing to the left, can reliably take place.

In order to ensure that the horizontal orientation of the head 42, taken in the accommodation space 13, remains that way during the transfer to the stick clamps 7 (observe that the packaging station 30 receives the heads 42 preferably in a horizontal position), an orienting plate 27 has been provided, which is attached to shaft 26a of the operation roller 26. The orienting plate 27 of figure 4A,B is buckled, as can be seen in figure 3 and in figure 6, and has plate member 27a, by which means orienting plate 27 has been attached to the shaft 26a, a plate member 27b protruding inclined therefrom, and buckled back again, raised plate member 27c. In figures 6A,B another embodiment of the orienting plate 27 is shown, of which the plate members 27b,c are situated in the same plane. The actual orienting means of the orienting plate 27 is the lower edge 27d, which may slightly engage a lollipop head 42.

In figures 4A and 6A it is schematically shown how the head 42 is able to rotate while it is taken along by the transfer disc 21. When the leading edge of the head 42 has reached the orienting edge 27d, it is oriented by said edge into a horizontal position while continuously moving the lollipop 40 anti-clockwise (B), which horizontal position corresponds with the position taken in the accommodation spaces 13 and, what it is all about, the chain direction. It is observed that this regards a basic orienting, small deviations need not be problematic, as is indicated in some of the figures.

The operation roller 26 is attached to the end of an arm 28, that is attached to a driven roller 29, which drive is controlled by the central operation unit that is not shown. By driving the roller 29 the arm 28 will be able to move up and down in the direction I, in order to move the roller 26 between the position shown in figure 4A and the position shown in figure 4B. In the latter position there is question of an inactive position of the roller 26, wherein the circumferential surface remains above the path of the clamp member ends 9a. This is of importance, because in an inactive position the stick clamps 7 that have already been provided with a stick, will not be opened when

passing along the transfer station in question. The orienting plate 27 with orienting edge 27d then also remains out of reach of the movement path of the heads of lollipops that were placed (much) earlier in the stick clamps. It is observed that the orienting plate 27 is attached on the axis 26a so as to be  
5 adjusted as to height, in order to be able to adjust the position as to height of the orienting edge 27d to the shape of the lollipop head 42.

By way of example figure 3 shows that of each four stick clamps already two have been provided with a lollipop 40. In the transfer station 20 shown  
10 each third stick clamp 7 is provided with a lollipop. At the moment shown, the roller 26 with the circumferential edge 26b is still out of reach from the stick clamp 7. When the stick clamps 7 with the held lollipops, which at that moment are at the level of the transfer station 30, have passed, the roller 26 is lowered for opening the immediately following stick clamp for receiving a  
15 lollipop 40. The lollipop 40 in question at this moment is still just before accommodation into a recess 22 of the transfer disc 21. On the left-hand side of the drawing a series of three stick clamps can be seen, in which lollipops 40a, 40b, 40c have been accommodated. The fourth stick clamp that is as yet empty will be operated at the left next transfer station 20,  
20 situated in front in the set-up according to figure 1.

The lollipops 40 thus clamped, are accommodated in the packaging station 30 with the heads and consecutive stick portions between the foils 50a, b, and the foils 50a, b are sealed together during passage between the sealing  
25 rollers 32a, 32b.

Directly downstream thereof the blade rollers 32a,b ensure separation of the double foil at a location between the lollipops, using blades 34a provided in ribs 34, which blades cooperate with anvils 35a provided in ribs 35. The  
30 blade rollers here (see figure 7) rotate in the directions J.

At side facing the perceiver of the drawing of figure 2, the blade rollers 32a,

b are each provided with a flange 62a,b on which the parts for simultaneously making "easy-openings", in this case notches, have been disposed. Thus a series of blades 36 has been disposed on blade roller 32a, and a series of anvils cooperating therewith have been disposed on a flange  
5 of blade roller 32b.

In figure 7A these parts are shown more clearly, in which it can be seen that anvil 37 is attached with two bolts on the flange of blade roller or anvil roller 32b. The blade 36 is built up from a blade holder 36a, which is attached to  
10 the flange by means of a bolt 45, and is provided with a narrow portion, on which the actual blade member 38 is attached by means of bolts 44a, b, which extend through the blade holder 36a and in the aforementioned flange for attachment thereon. The blade member 38 is further shown in figure 7b, and has two elongated holes 43a,b and a cutting edge 39. A shoulder 47 is  
15 provided at the side facing away from the cutting edge 39.

In the mounted situation shown in figure 7A the cutting edge 39 is turned in downstream direction (arrow J), and the same applies to the shoulder 47. The lower end of a widened head of a bolt 48 supports against the shoulder  
20 47, which bolt 48 extends into a hole 46 made for that purpose in the blade holder 36a. Adjustment of the blade member 38a, and thus of the cutting edge 39 may take place by slightly loosening the bolts 44a, 44b and then by using an Allenkey moving the head of the bolt 48 in the hole 46. Due to abutment of the bolt head against the shoulder 47 the blade member 38 is  
25 also moved, which movement is made possible by the elongated holes 43a,b. When the wanted position has been reached, the bolts 44a, 44b can be secured again. The position of the bolt 48 can be secured again using a suitable means extending in the hole 49.

30 By means of the cutting edges 39 the notches or incisions 53, shown in figure 8 can be made. It can be seen that these notches are situated at a small distance adjacent to the separation line 52 between the consecutive

packagings, such that by further tearing the notch 53, the tear reaches the unsealed portion 51 where the lollipop head 42 is situated. Spots 54 are furthermore shown, that are used in the usual manner for indexing the clamps 7 of the conveyor 6 with optional pictures (logos) on the foil web.

## Claims

1. Device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided  
5 with a series product holders positioned one after the other in conveyance direction, and a feed station having means for singled supply to the supply conveyor, wherein the feed station comprises at least one feed conveyor provided with accommodation spaces for each time accommodating a head of a product and placed for conveyance of the products to a transfer station  
10 for transfer of the products to the supply conveyor, wherein the feed station furthermore comprises, a particularly stationary, spreading table extending adjacent to the feed conveyor and forming a working surface for an operator.
2. Device according to claim 1, wherein the spreading table extends along  
15 several sides of the feed conveyor, particularly along both sides.
3. Device according to claim 1 or 2, wherein the feed conveyor comprises a disc that is rotatable about a vertical axis, which disc is provided with accommodation spaces at its circumference.  
20
4. Device according to claim 3, wherein the spreading table is situated connecting to the circumference of the disc.
5. Device according to claim 3 or 4, wherein the disc has parts forming  
25 bottoms of the accommodation spaces, preferably provided with local passages.

6. Device according to any one of the preceding claims, wherein the feed conveyor forms a top surface in which the accommodations spaces have been formed and which is situated at substantially the same level as the surface of the spreading table.

5

7. Device according to claim 6, wherein the top surface is situated at the same level or slightly below the surface of the spreading table.

8. Device according to any one of the preceding claims, comprising a number  
10 of feed conveyors that are placed functionally parallel.

9. Device according to claim 8, wherein each feed conveyor comprises its own transfer station, wherein the transfer stations are spaced apart along the supply conveyor.

15

10. Device according to claim 9, comprising first means for driving the feed conveyor and second means for driving the supply conveyor, wherein the first driving means drive the feed conveyor at a speed that is  $1/(\text{number of feed conveyors}) \times \text{the speed of the supply conveyor}$ .

20

11. Device according to claim 8, 9 or 10, wherein the transfer station is provided with means for operating the product holders on the supply conveyor for bringing them in a receiving position, and with means for activating the operation means at a frequency equalling the speed of the feed  
25 conveyor in question.

12. Device according to any one of the preceding claims, comprising orienting means for orienting the head of the product when transferring it into the product holder in a plane perpendicular to the stick, preferably prior  
30 to actual transfer to the product holder, wherein the orienting means preferably are part of the transfer station.

13. Device according to claim 12, wherein the orienting means comprise an orienting surface situated in the path of the head of the product when transferring it into the product holder.
- 5 14. Device according to claim 11 and 12 or 13, wherein the orienting means are movable with the operation means.
- 10 15. Device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided with a series of product holders positioned one after the other in conveyance direction, and a feed station having means for singled supply to the supply conveyor, wherein the feed station comprises at least one feed conveyor  
15 provided with accommodation spaces for each time accommodating a head of a product and placed for conveyance of the products to a transfer station for transfer of the products to the supply conveyor, wherein the device comprises a number of feed conveyors that are placed functionally parallel.
- 20 16. Device according to claim 15, wherein each feed conveyor comprises its own transfer station, wherein the transfer stations are spaced apart along the supply conveyor.
- 25 17. Device according to claim 16, comprising first means for driving the feed conveyor and second means for driving the supply conveyor, wherein the first driving means drive the feed conveyor at a speed that is  $1/(\text{number of feed conveyors}) \times \text{the speed of the supply conveyor}$ .
- 30 18. Device according to claim 15, 16 or 17, wherein the transfer station is provided with means for operating the product holders on the supply conveyor for bringing them in a receiving position, and with means for activating the operation means at a frequency equalling the speed of the feed

conveyor in question.

19. Device according to any one of the claims 15-18, wherein the feed conveyors comprise discs that are rotatable about a vertical axis, which discs  
5 are provided with accommodation spaces at their circumference.

20. Device according to claim 19, wherein each disc has parts forming bottoms of the accommodation spaces, the bottoms preferably being provided with local passages.

10

21. Device according to any one of the claims 15-20, wherein the supply station furthermore comprises a spreading table extending adjacent to the feed conveyors and forming a working surface for an operator.

15 22. Circular disc provided with a series of accommodation spaces for the heads of lollipops and suchlike products provided with a head and stick, wherein the disc has parts forming bottoms of the accommodation spaces, wherein the bottoms preferably are provided with local passages.

20 23. Device for packaging products provided with a head and stick, such as lollipops, comprising a packaging station for packaging the products in packaging material, such as foil, a supply conveyor for supplying the products to the packaging station, wherein the supply conveyor is provided with a series of product holders positioned one after the other in conveyance  
25 direction, wherein the packaging station comprises a pair of cooperating sealing rollers, a first and a second supply for supplying a first and a second web of packaging material to the sealing rollers, where the webs are sealed together, enclosing at least the head of the product, and a pair of cooperating blade rollers for separating the packaged products, wherein the  
30 supply conveyor is placed for conveying the products confined between both packaging webs, in between the sealing rollers and the blade rollers, wherein the pair of blade rollers is provided with additional cutting means for forming

an incision in the packaging.

24. Device according to claim 23, wherein the additional cutting means are placed for forming an incision extending from the edge of the packaging.

5

25. Device according to claim 23 or 24, wherein the additional cutting means are situated at the side of the head facing way from the stick.

26. Device for packaging products provided with a head and stick, such as  
10 lollipops, comprising a packaging station for packaging the products in  
packaging material, such as foil, a supply conveyor for supplying the  
products to the packaging station, wherein the supply conveyor is provided  
with a series product holders positioned one after the other in conveyance  
direction, and a feed station having means for singled supply to the supply  
15 conveyor, wherein the feed station comprises at least one feed conveyor  
provided with accommodation spaces for each time accommodating a head  
of a product and placed for conveyance of the products to a transfer station  
for transfer of the products to the supply conveyor, further comprising  
orienting means for orienting the head of the product when transferring it  
20 into the product holder in a plane perpendicular to the stick.

27. Device according to claim 26, wherein the orienting means are  
positioned for engaging the head prior to actual transfer to the product holder  
has taken place.

25

28. Device according to claim 26 or 27, wherein the orienting means  
comprise an orienting surface that is situated in the path of the head of the  
product when transferring it into the product holder.

30 29. Device according to claim 28, wherein the orienting surface extends  
according to a path that is parallel to the path of the product holders.

30. Device according to claim 28 or 29, wherein the orienting surface is formed by an edge, preferably an edge of a plate.

31. Device according to claim 26-30, wherein the orienting means are part of  
5 the transfer station.

32. Device provided with one or more of the characterizing measures described in the attached description and/or shown in the attached drawings.

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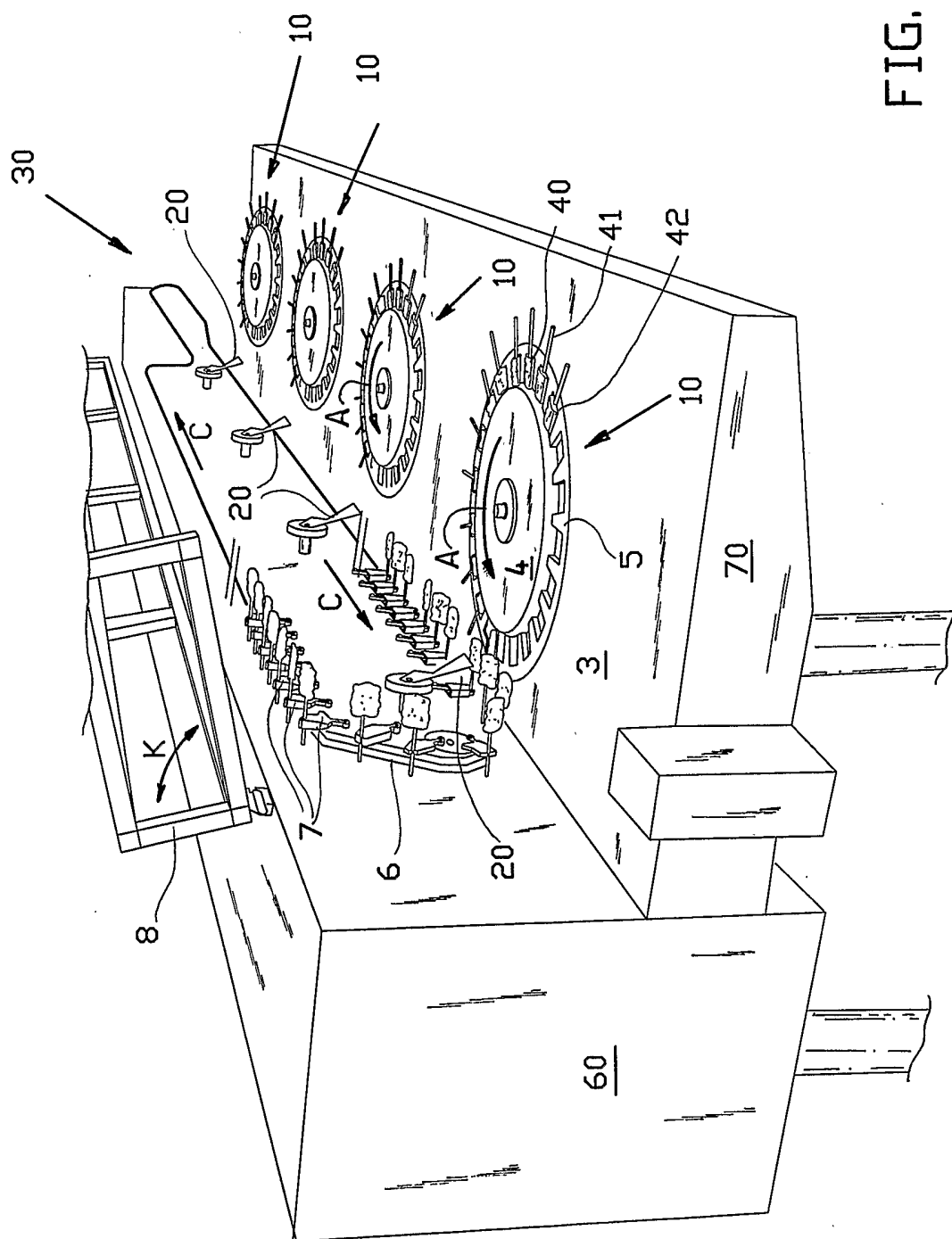
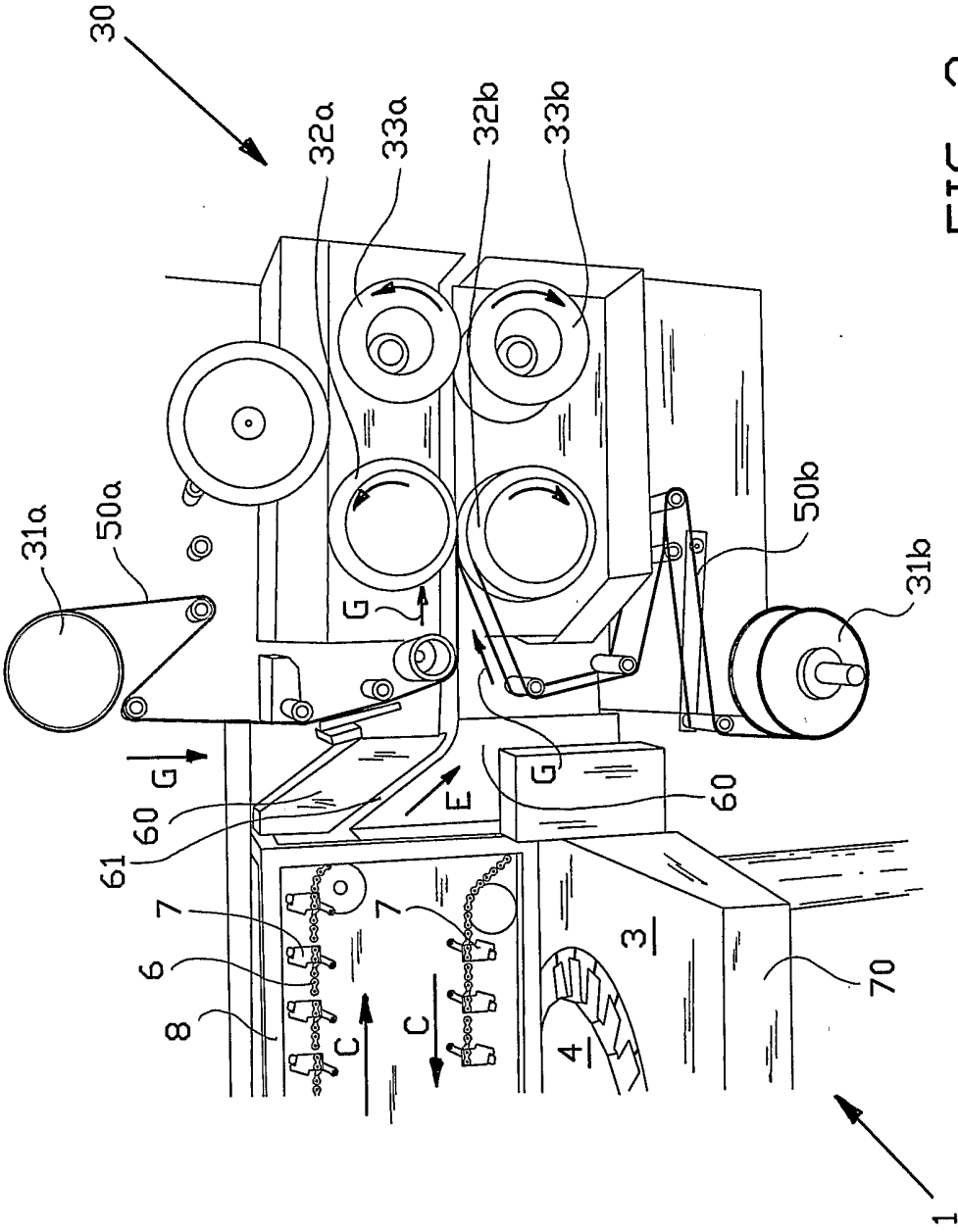


FIG. 1



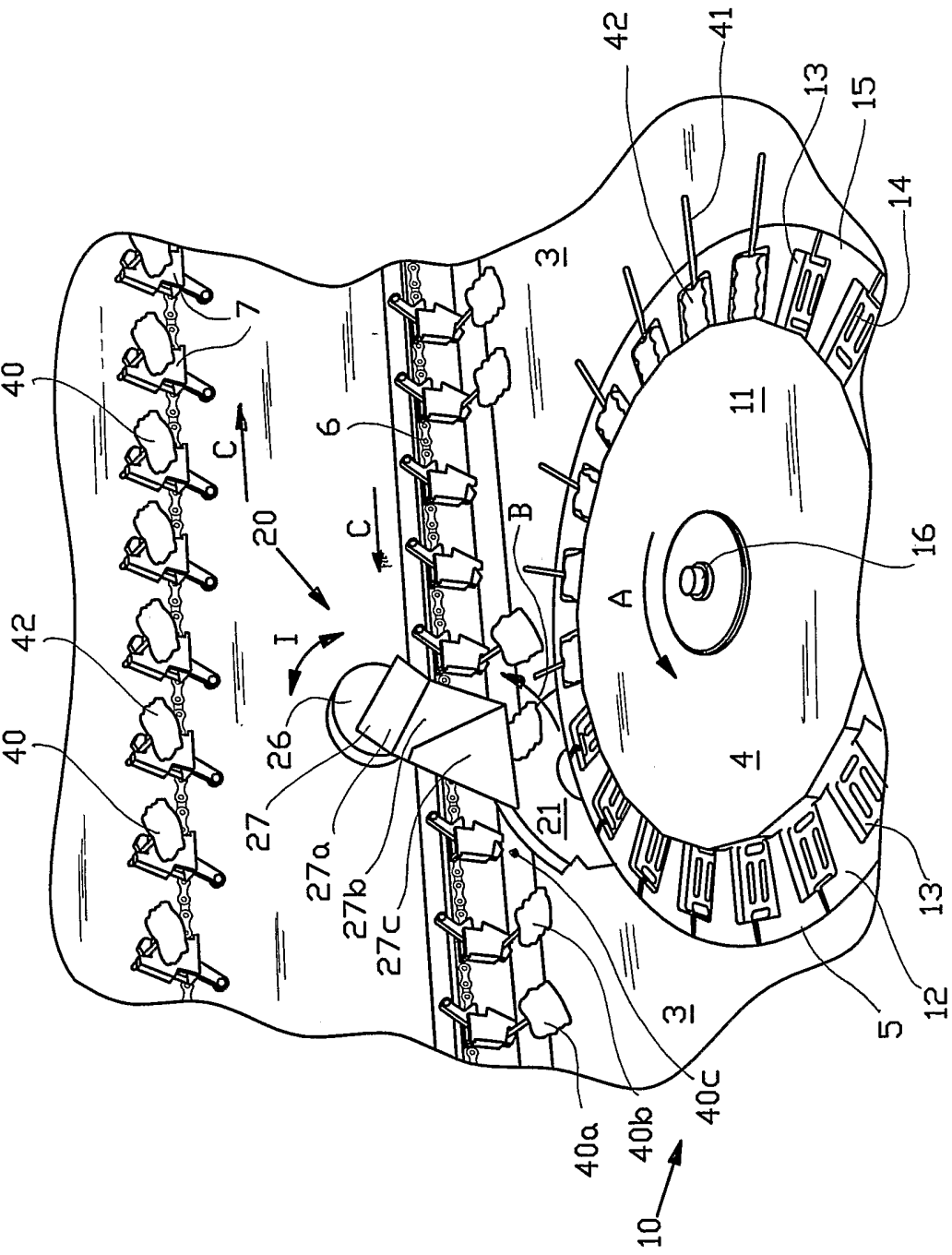


FIG. 3

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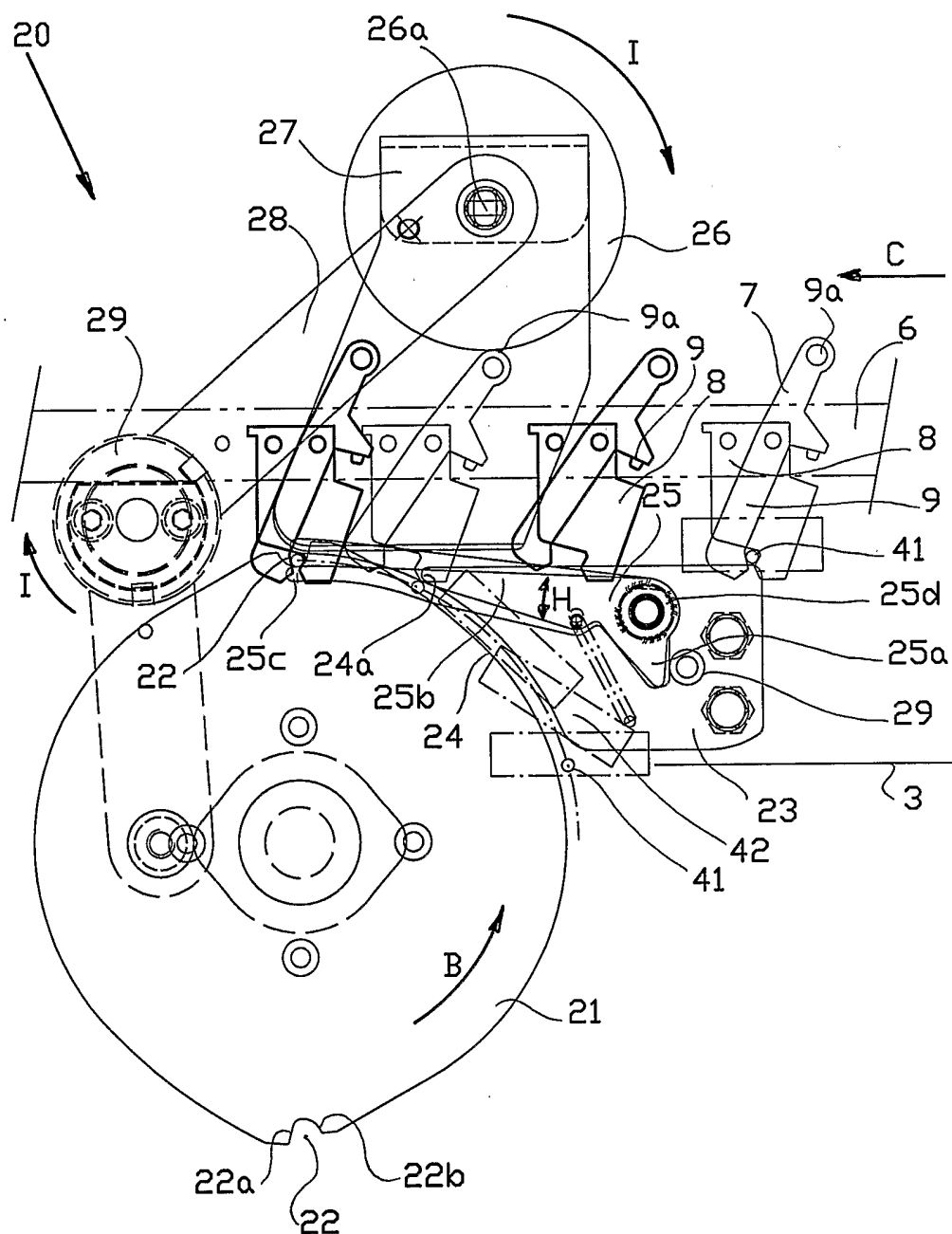


FIG. 4A

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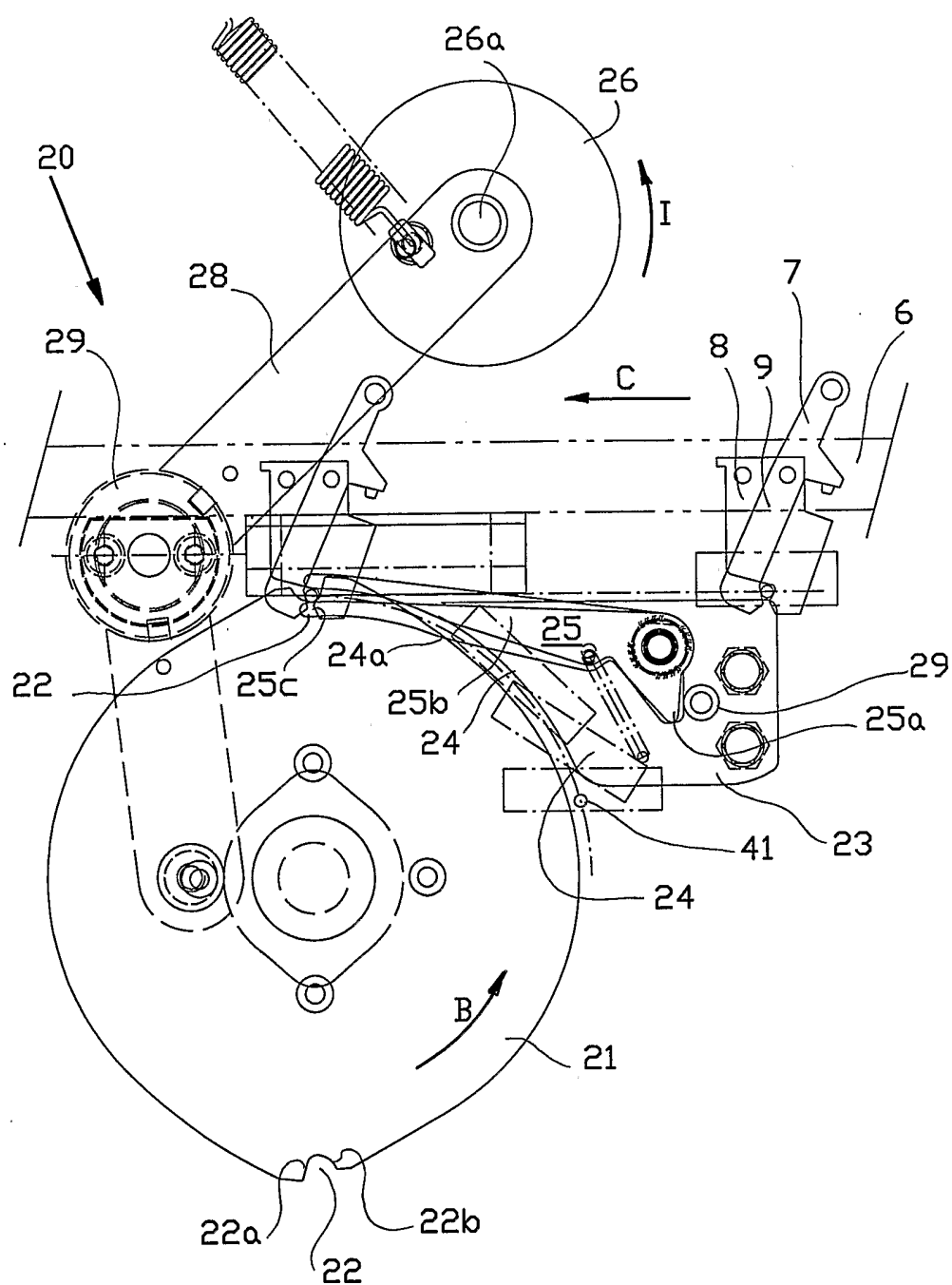
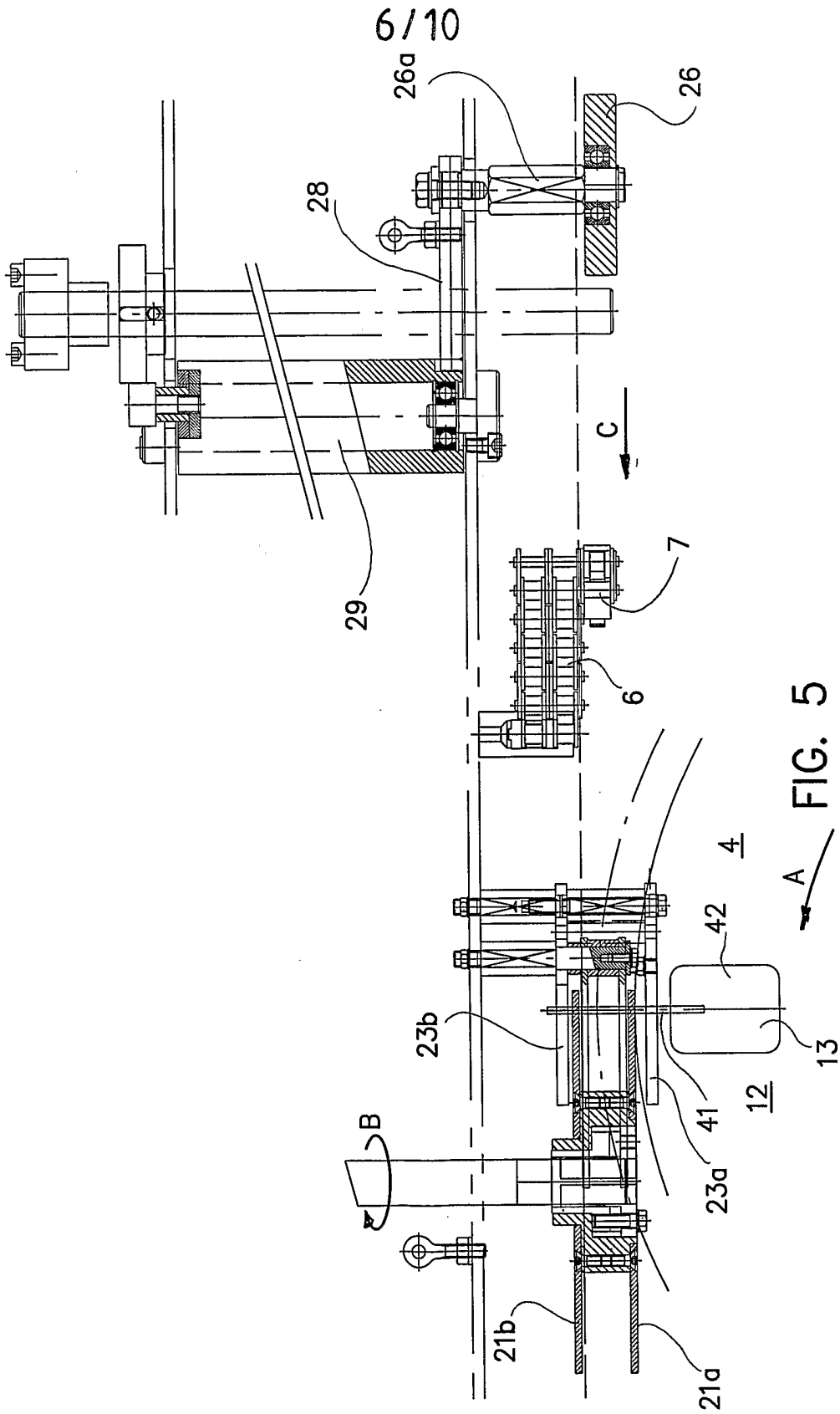


FIG. 4B



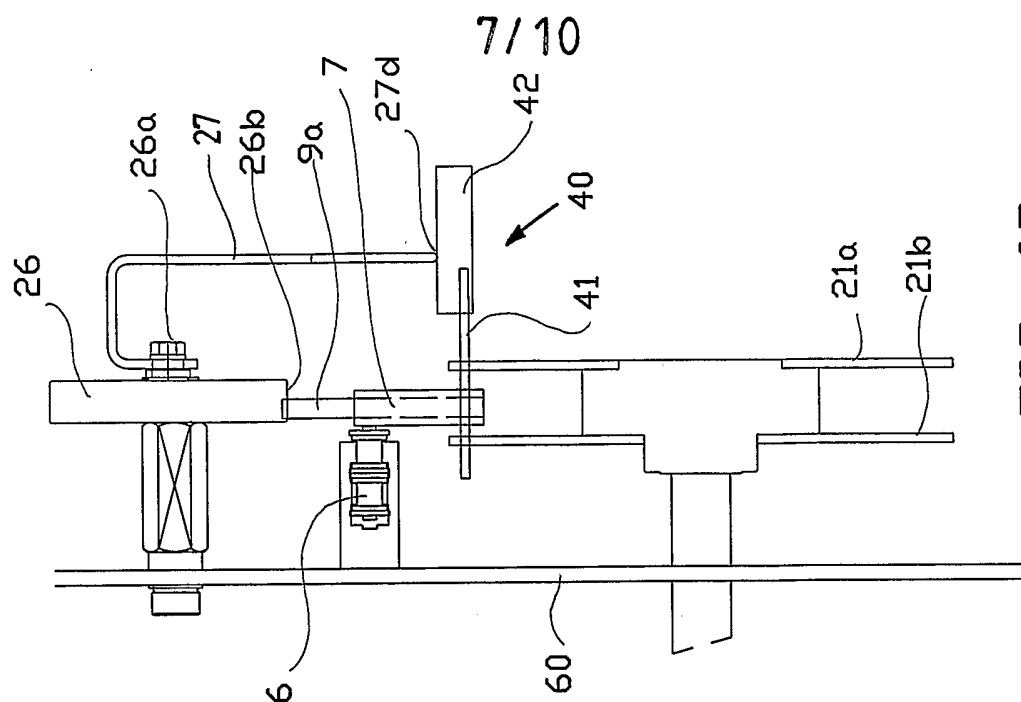


FIG. 6B

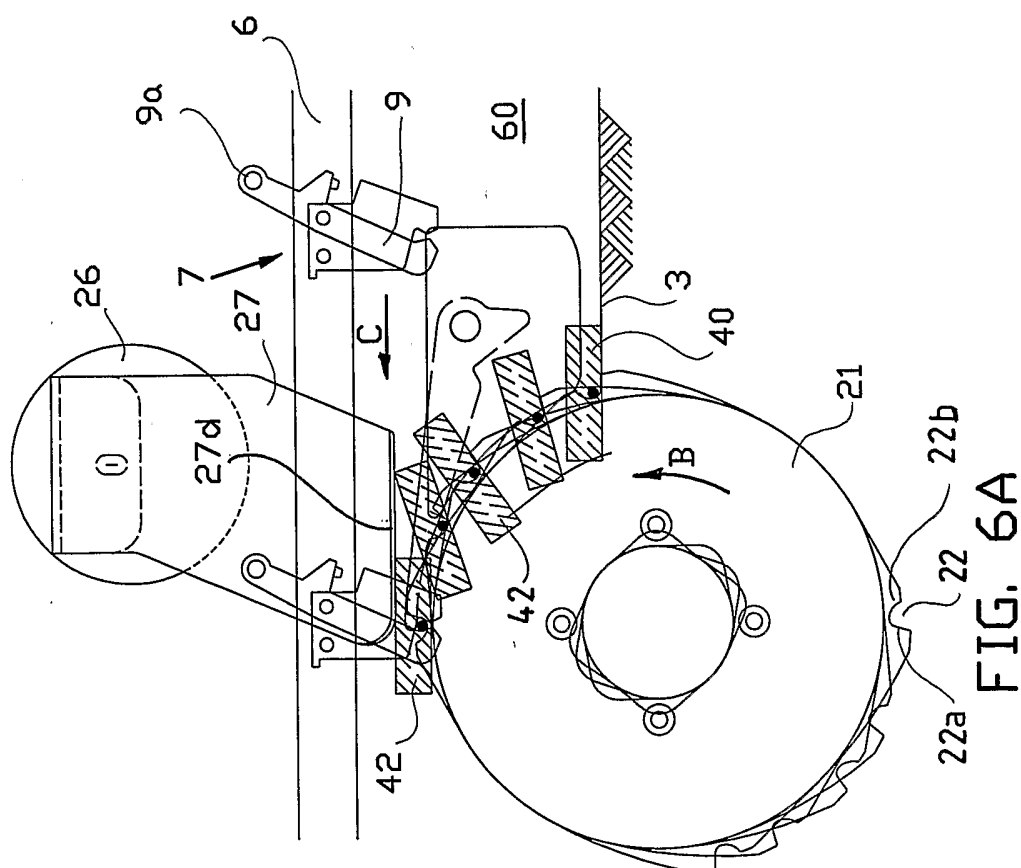


FIG. 6A

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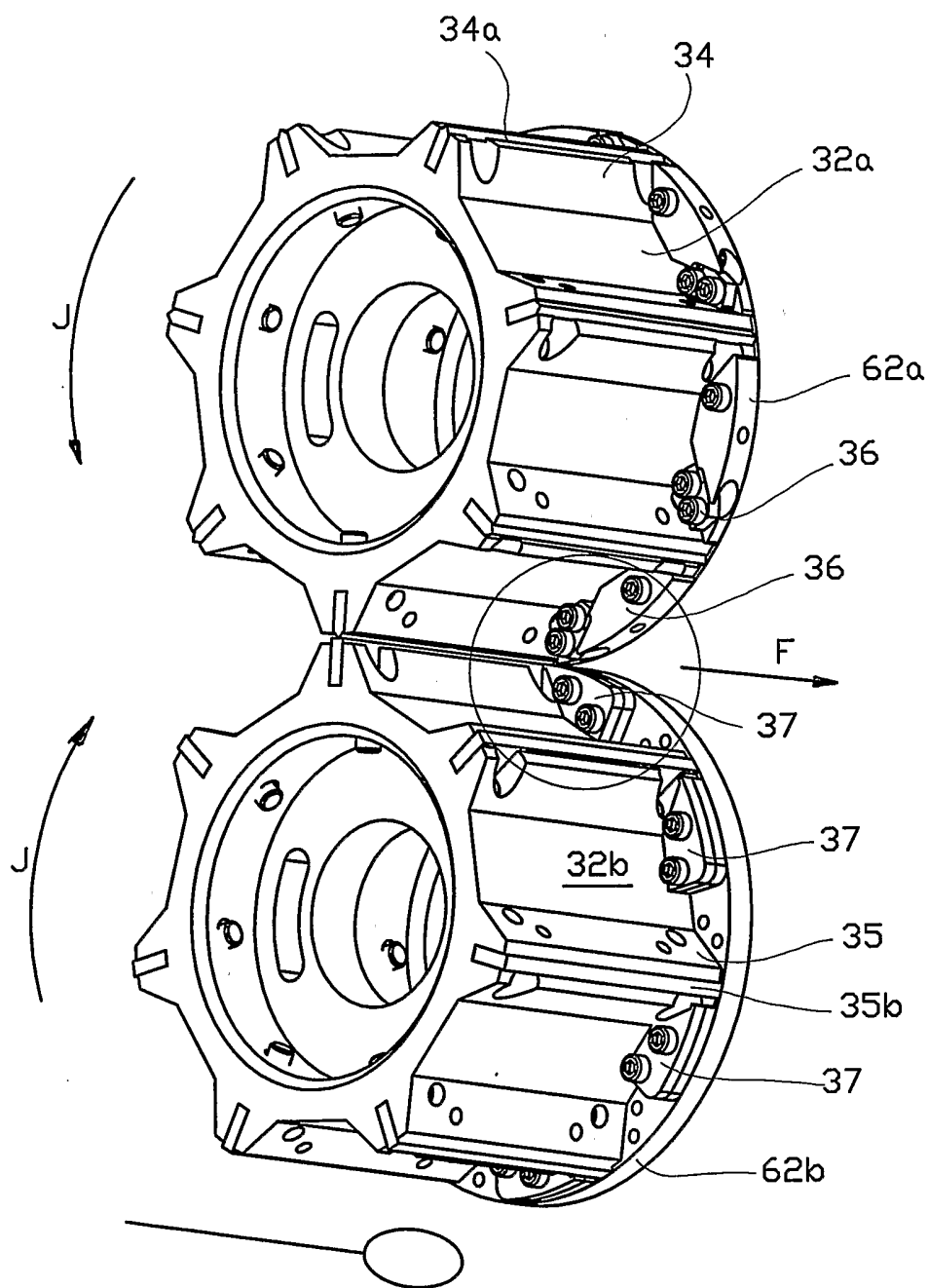


FIG. 7

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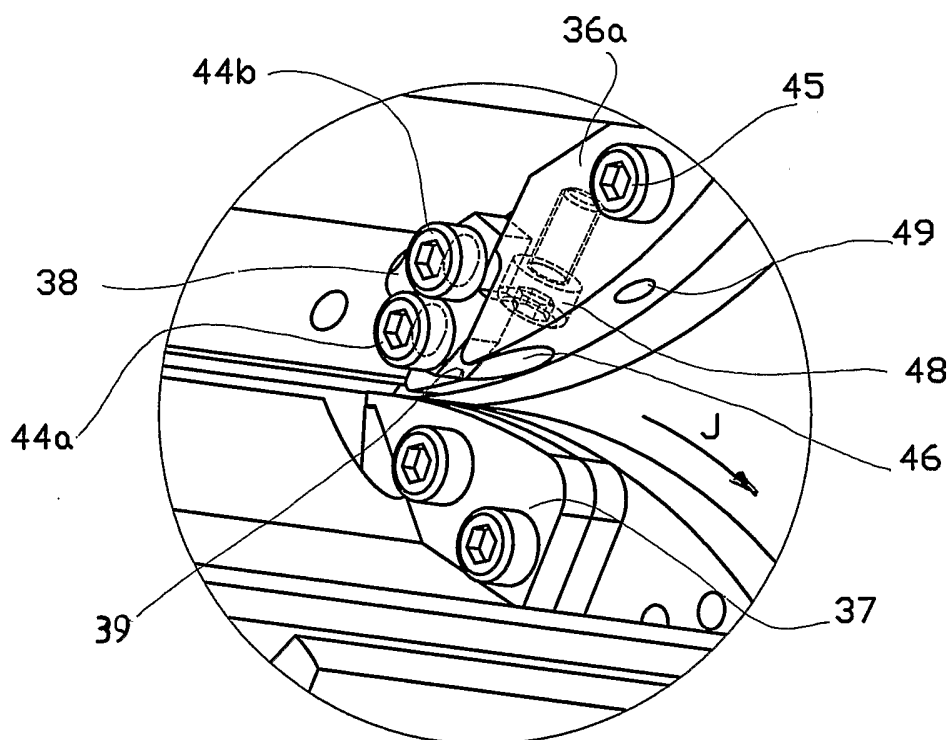


FIG. 7A

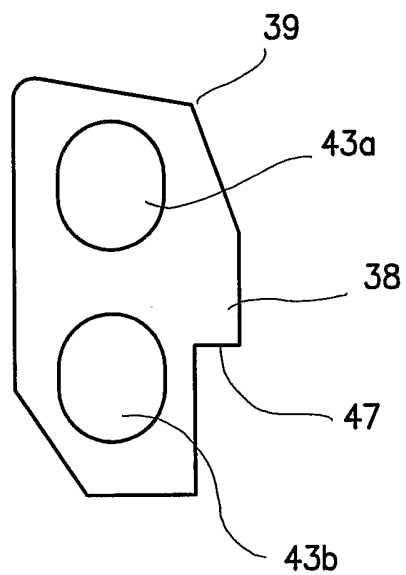


FIG. 7B

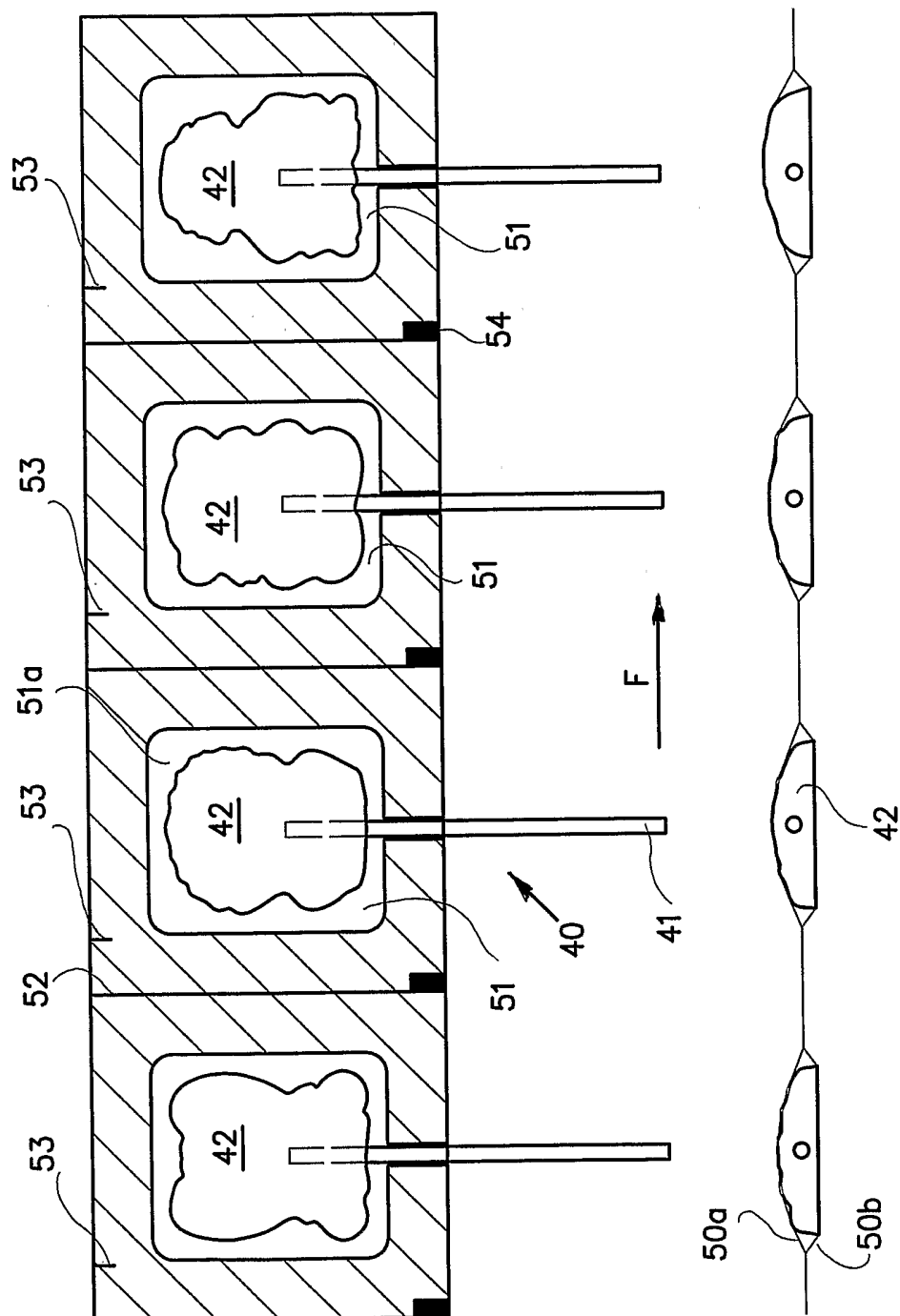


FIG. 8

# INTERNATIONAL SEARCH REPORT

Application No  
/NL2004/000447

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65B9/02 B65B35/26 B65B67/00 B65B35/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65B B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages                           | Relevant to claim No. |
|------------|--------------------------------------------------------------------------------------------------------------|-----------------------|
| Y          | WO 03/043436 A (CFS WEERT B V ;ASMA SEFERINUS JELLE (NL); DER KINDEREN HENRICUS AN) 30 May 2003 (2003-05-30) | 1-5                   |
| A          | page 13, line 5 - page 16, line 10;                                                                          | 26                    |
| X          | figures                                                                                                      | 23                    |
| Y          | EP 1 310 430 A (AZIONARIA COSTRUZIONI) 14 May 2003 (2003-05-14)                                              | 1-5                   |
|            | column 2, line 30 - column 4, line 54;                                                                       |                       |
|            | figures                                                                                                      |                       |
| X          | EP 1 283 183 A (EUROSICMA SRL) 12 February 2003 (2003-02-12)                                                 | 22                    |
| Y          | column 2, line 1 - column 3, line 49;                                                                        | 5                     |
| A          | figures                                                                                                      | 15, 19, 20            |
|            | -----<br>-/--                                                                                                |                       |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

14 October 2004

Date of mailing of the international search report

27/10/2004

Name and mailing address of the ISA

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Vigilante, M

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| Application No<br>/NL2004/000447 |
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| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                    |                       |
|------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------|
| Category °                                           | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A                                                    | EP 0 036 282 A (WRIGLEY W M JUN CO)<br>23 September 1981 (1981-09-23)<br>-----     |                       |
| A                                                    | US 5 450 706 A (LATINI LEO)<br>19 September 1995 (1995-09-19)<br>-----             |                       |

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Information on patent family members

Application No

/NL2004/000447

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s)                                                           | Publication<br>date                                                |
|-------------------------------------------|---|---------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| WO 03043436                               | A | 30-05-2003          | NL 1019408 C2<br>BR 0214446 A<br>EP 1446021 A1<br>WO 03043436 A1                     | 27-05-2003<br>14-09-2004<br>18-08-2004<br>30-05-2003               |
| EP 1310430                                | A | 14-05-2003          | IT B020010668 A1<br>EP 1310430 A1                                                    | 05-05-2003<br>14-05-2003                                           |
| EP 1283183                                | A | 12-02-2003          | IT MI20011736 A1<br>AT 267130 T<br>DE 60200501 D1<br>DE 60200501 T2<br>EP 1283183 A1 | 07-02-2003<br>15-06-2004<br>24-06-2004<br>14-10-2004<br>12-02-2003 |
| EP 0036282                                | A | 23-09-1981          | EP 0036282 A1                                                                        | 23-09-1981                                                         |
| US 5450706                                | A | 19-09-1995          | NONE                                                                                 |                                                                    |