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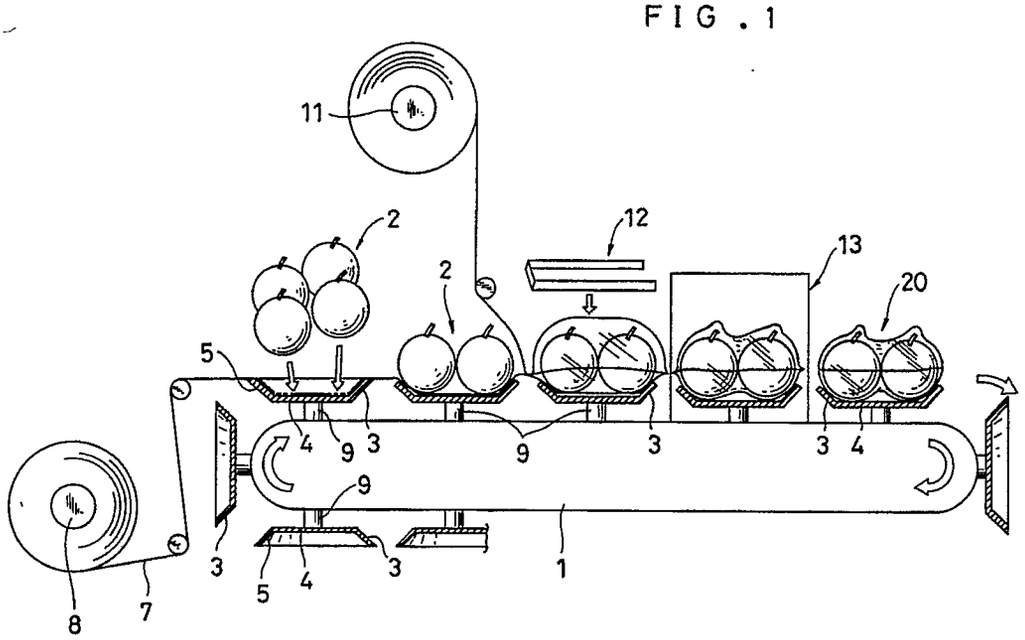
(54) Apparatus for packaging articles.

(57) A wrapping apparatus comprises a plurality of buckets (3) conveyed one by one at intervals, a lower wrapping film (7) spread on the plurality of buckets, and an upper wrapping film (10) overing objects (2) on mount portions (4) of the buckets from above through the lower wrapping film. Each of the buckets has side walls (5) for preventing the objects from falling when the objects are wrapped in the upper and lower wrapping films, and functions as a tray. According to the apparatus, since a tray which is used in conventional wrapping of objects, such as fresh products, is not necessary, it is possible to avoid wasteful use of a tray and to reduce production cost.

FIG. 1



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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a wrapping apparatus suited for wrapping a plurality of objects to be wrapped, particularly, fresh products.

Description of the Related Art

For example, a plurality of fresh products are likely to be shipped and sold while being wrapped in a wrapping film as a package.

In order to automatically wrap many fresh products in a wrapping film, it is necessary to wrap these fresh products in a stable state in a wrapping operation. Conventionally, a predetermined number of fresh products are collected on one of trays which are conveyed one by one by a transport device, such as a conveyor, and both the fresh products and the tray are wrapped in a film.

However, the user who bought the fresh products thus wrapped is required to unseal the film and dispose of the tray before eating the fresh products. Refuse disposal has lately attracted considerable attention as a social problem, and such disposal of the tray is not preferable.

Furthermore, since it is necessary to prepare trays in accordance with wrapping materials for wrapping a plurality of fresh products, production cost is high.

SUMMARY OF THE INVENTION

With the above problems in view, an object of the present invention is to serve to solve a refuse disposal problem and reduce production cost by wrapping a plurality of objects without using any tray.

According to one aspect of the present invention, there is provided a wrapping apparatus which comprises a plurality of buckets 3 conveyed one by one at intervals, a lower wrapping film 7 spread on the plurality of buckets 3, and an upper wrapping film 10 for covering objects 2 laid on mount portions 4 of the buckets 3 from above through the lower wrapping film 7. Each of the buckets 3 has a side wall 5 for preventing the objects 2 from falling when the objects 2 are wrapped in the upper and lower wrapping films 10 and 7.

It is preferable to movably mount a side wall 5c of the bucket 3 so that the area of the mount portion 4 can be changed.

According to the apparatus having the above construction, if a predetermined number of objects to be wrapped are laid on the bucket 3 on which the lower wrapping film 7 is spread, the objects 2 are prevented from falling by the side wall 5 and held in a stable state.

Since the objects 2 are wrapped in the upper and lower wrapping films 7 and 10 on the bucket 3 in a stable state, the bucket 3 functions as a tray, and a tray which is necessary in conventional wrapping is not necessary.

Furthermore, if the side wall 5c of the bucket 3 is movable, it is possible to flexibly cope with a change in the number or kind of objects 2 laid on the bucket 3 by changing the area of the mount portion 4 while moving the side wall 5c.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a general front view of a wrapping apparatus according to the present invention;

Fig. 2 is a top view of a bucket on which objects to be wrapped are laid according to an embodiment of the present invention;

Fig. 3(a) is a perspective view of a bucket according to another embodiment of the present invention;

Fig. 3(b) is a cross-sectional view of the bucket;

Fig. 4 is a perspective view of the bucket;

Figs. 5(a) to 5(d) are top views showing the state in which objects to be wrapped are laid on the bucket; and

Fig. 6 is a perspective view of a bucket according to still another embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will now be described.

Referring to Fig. 1, a conveyor 1 is cyclically movable and rotated by a drive mechanism (not shown) in a direction indicated by an arrow.

A plurality of buckets 3 for laying fresh products 2 thereon are mounted at regular intervals on the conveyor 1 through supporting shafts 9. Each of the buckets 3 is in the shape of a rectangular plate, and composed of a flat mount portion 4 and side walls 5 which diagonally extend upward from the peripheral edges of the mount portion 4.

The area of the mount portion 4 is properly set in consideration of the shape and number of the fresh products 2 to be laid thereon. The side walls 5 are continuously mounted in order to prevent the fresh products 2 from falling by abutting against the fresh products 2 when the fresh products 2 are wrapped in upper and lower films 10 and 7. The height of the side walls 5 can also be appropriately set.

The lower wrapping film 7 shrinks at low temperature, is wound in the shape of a roll, and set at one side of the conveyor 1 (upstream in the direction in which the bucket 3 moves on the conveyor

1). The lower wrapping film 7 is rotatably supported by a shaft 8 to be sent out so that one end of the lower wrapping film 7 is laid on the mount portion 4 of the bucket 3 located upstream.

The width of the lower wrapping film 7 is set longer than the space between the side walls 5 of the bucket 3 opposite to each other.

The upper wrapping film 10 is made of the same material and has the same width as those of the lower wrapping film 7, located above the conveyor 1, and is rotatably supported by a shaft 11 to be sent out and cover the fresh products 2 laid on the bucket 3.

A three side heat sealer 12 has three sides and is vertically movable so as to weld and fuse by heat the upper and lower wrapping films 10 and 7 which are superposed to wrap a plurality of fresh products 2 laid on the bucket 3.

A shrink tunnel 13 shrinks by heat the upper and lower wrapping films 10 and 7 in a tense state when the fresh products 12 wrapped in the upper and lower wrapping films 10 and 7 pass through the shrink tunnel 13 while laid on the bucket 3, and is located downstream from the heat sealer 12.

The wrapping of the fresh products 2 in the wrapping apparatus having the above construction will now be described.

First, one end of the lower wrapping film 7 is spread on the bucket 3 located upstream of the conveyor 1 which is rotatably driven, and a predetermined number of fresh products 2 are supplied onto the bucket 3 by an automatic supply device (not shown). The supplied fresh products are laid on the mount portion 4 of the bucket 3 through the lower wrapping film 7, abut against the side walls 5 as shown in Fig. 2 without falling, and do not move in the bucket 3.

One end of the upper wrapping film 10 is welded to one end of the lower wrapping film 7 previous to the operation of the conveyor 1, and the upper and lower wrapping films 10 and 7 are sent out in correlation to the movement of the bucket 3 on which the fresh products 2 are laid.

When the bucket 3 reaches below the heat sealer 12, the heat sealer 12 descends, welds and fuses by heat the peripheral edges of the upper and lower wrapping films 10 and 7 covering the fresh products 2. The fresh products 2 wrapped in the upper and lower wrapping films 10 and 7 come into the shrink tunnel 13, and the upper and lower wrapping films 10 and 7 are shrunk by heat in the shrink tunnel 13.

Since the shrunk films 7 and 10 are in close contact with the fresh products 2 in a tension state, the fresh products 2 do not move and the state at wrapping is maintained.

The fresh products 2 thus wrapped by shrinking fall as a package 20 from the bucket 3 downstream of the conveyor 1, and are conveyed into a subsequent process, such as packing, by an unillustrated conveyor.

The above wrapping of the fresh products 2 is sequentially performed on each bucket 3.

Although the bucket 3 is in the shape of a plate in the above embodiment, as shown in Figs. 3(a) and 3(b), the mount portion 4 tilting in the advance direction of the bucket 3 and left and right side walls 5a and a rear side wall 5b may be constituted by a pair of left and right frames 25 and a plurality of extensible connecting rods 26 connected to the frames 25 so that the area of the mount portion 4 can be changed in accordance with the size, number and kind of the fresh products 2.

Furthermore, since the bucket 3 tilts upward at its front side and the width of the bucket 3 is adjustable, it is possible to wrap the fresh products 2 regardless of the number of the fresh products 2 while the fresh products 2 are abutting against the rear side wall 5b. Therefore, it is possible to immediately cope with a change in number of the fresh products 2 to be wrapped and to avoid wasteful use of wrapping films. The tilt angle of the mount portion 4 can be changed by rotating the bucket 3 on a slide shaft 28.

The bucket 3 may be set as shown in Figs. 4 to 6.

Referring to Fig. 4, a movable side wall 5c has a supporting portion 16. A bolt 18 is inserted through the supporting portion 16 and an extended hole 17 formed on the mount portion 4 at the front thereof in the advance direction, and engages one end of the supporting shaft 9 while fastening the movable side wall 5c and the mount portion 4 together.

The movable side wall 5c can be moved along the extended hole 17 and rotated on the bolt 18 as indicated by virtual lines by unfastening the bolt 18.

Furthermore, the left and right side walls 5 may also be movable. In this case, the fresh products 2 can be wrapped in manners as shown in Fig. 5(a) to 5(d).

The bucket 3 may be divided into four parts as shown in Fig. 6 so as to be extensible.

As the upper and lower wrapping films 10 and 7, a perforated film, a foaming film or a heat non-shrink film can be used. If the heat non-shrinking film is used, the shrink tunnel 13 is not necessary.

It is obvious that the details of construction of parts described in the present invention can be arbitrarily changed and that the objects 2 to be wrapped are not limited to fresh products.

As described above, according to the present invention, since the bucket on which objects to be wrapped are laid through the lower wrapping film has the side walls, the objects can be wrapped on the bucket in a stable state.

As a result, even if a plurality of objects are collected and wrapped, there is no need to use any tray used in conventional wrapping. Therefore, a wrapping apparatus can serve to solve the refuse disposal problem and is extremely practical.

Furthermore, since the objects can be wrapped without using a tray as described above, production cost can be reduced.

In addition, if the side walls of the bucket are movable so that the area of the mount portion can be changed, it is possible to flexibly cope with a change in number or kind of objects laid on the bucket.

Claims

1. A wrapping apparatus, comprising:

   a plurality of buckets 3 conveyed one by one at intervals;

   a lower wrapping film 7 spread on said plurality of buckets 3; and

   an upper wrapping film 10 for covering objects 2 laid on mount portions 4 of said buckets 3 from above through said lower wrapping film 7,

   wherein each of said buckets 3 having a side wall 5 for preventing said objects 2 from falling when said objects 2 are wrapped in said upper and lower wrapping films 10 and 7.

2. A wrapping apparatus according to claim 1, wherein said side wall 5 of said bucket 3 is movable so that the area of said mount portion 4 can be changed.

3. A wrapping apparatus according to claim 2, wherein said bucket 3 is composed of a pair of left and right frames 25 and a plurality of extensible connecting rods 26 connected to said frames 25.

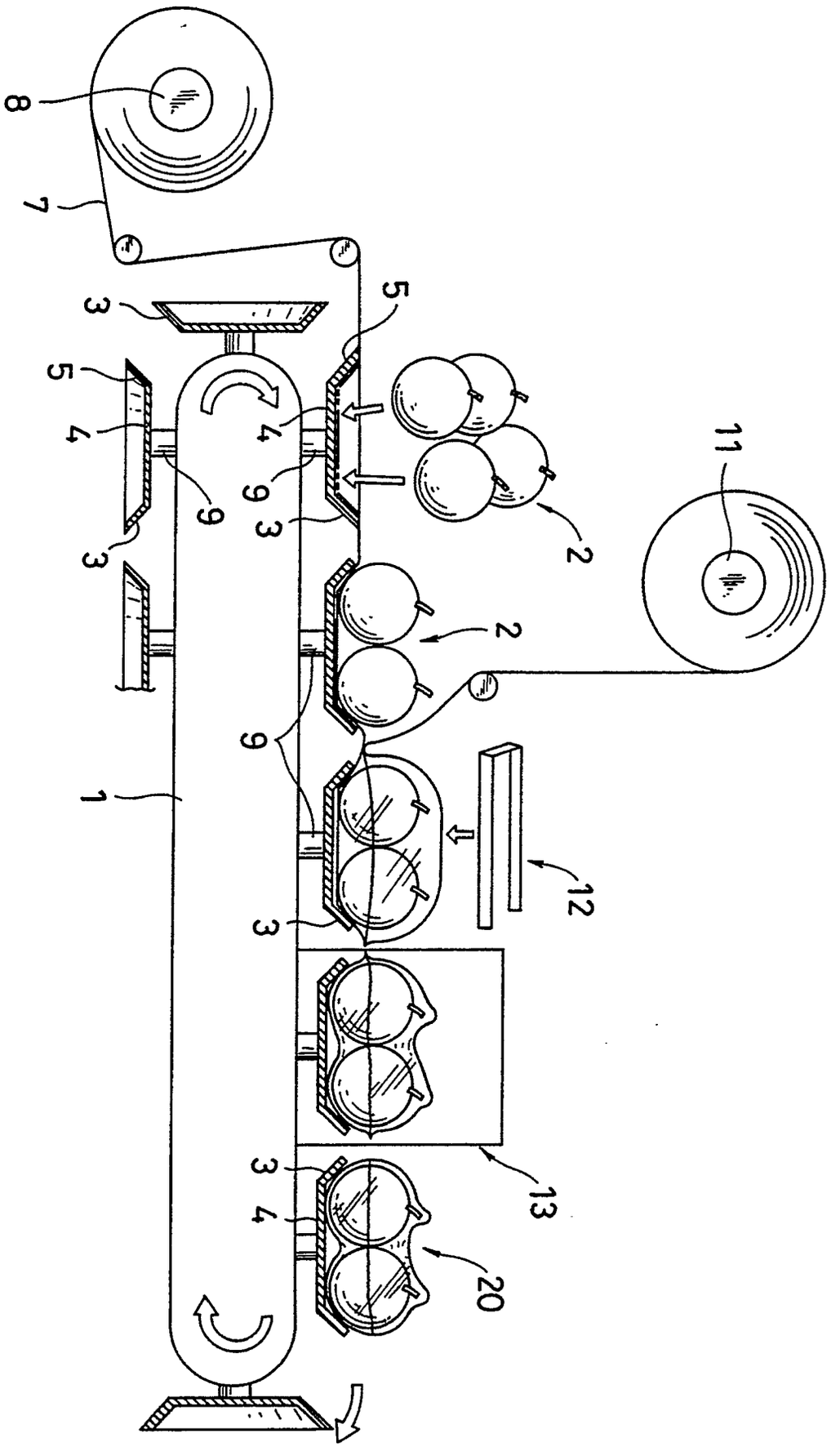


FIG. 1

FIG. 2

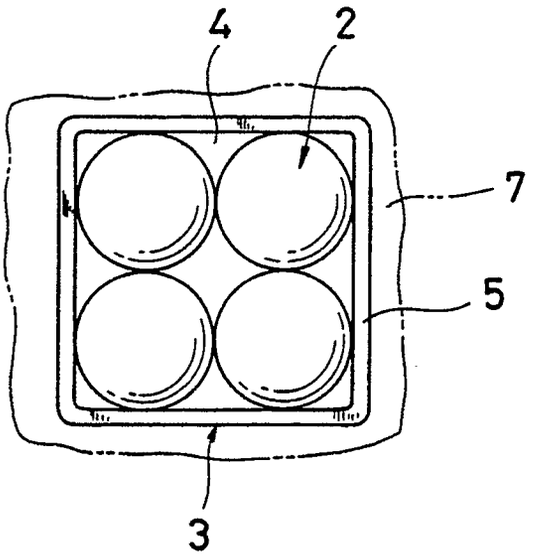


FIG. 3 (a)

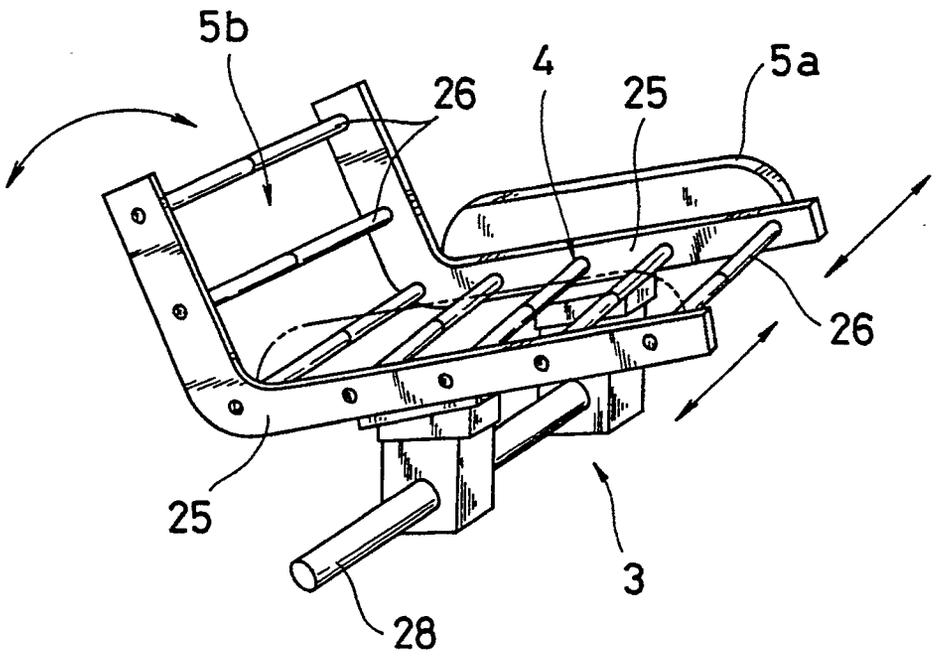


FIG. 3 (b)

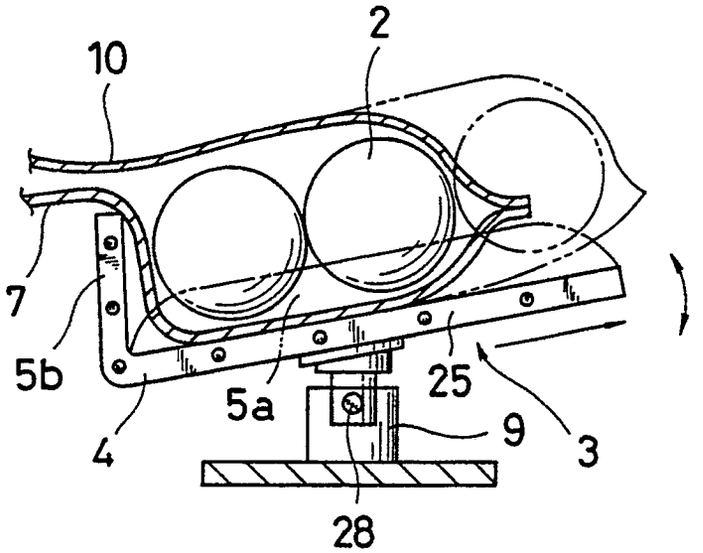


FIG. 4

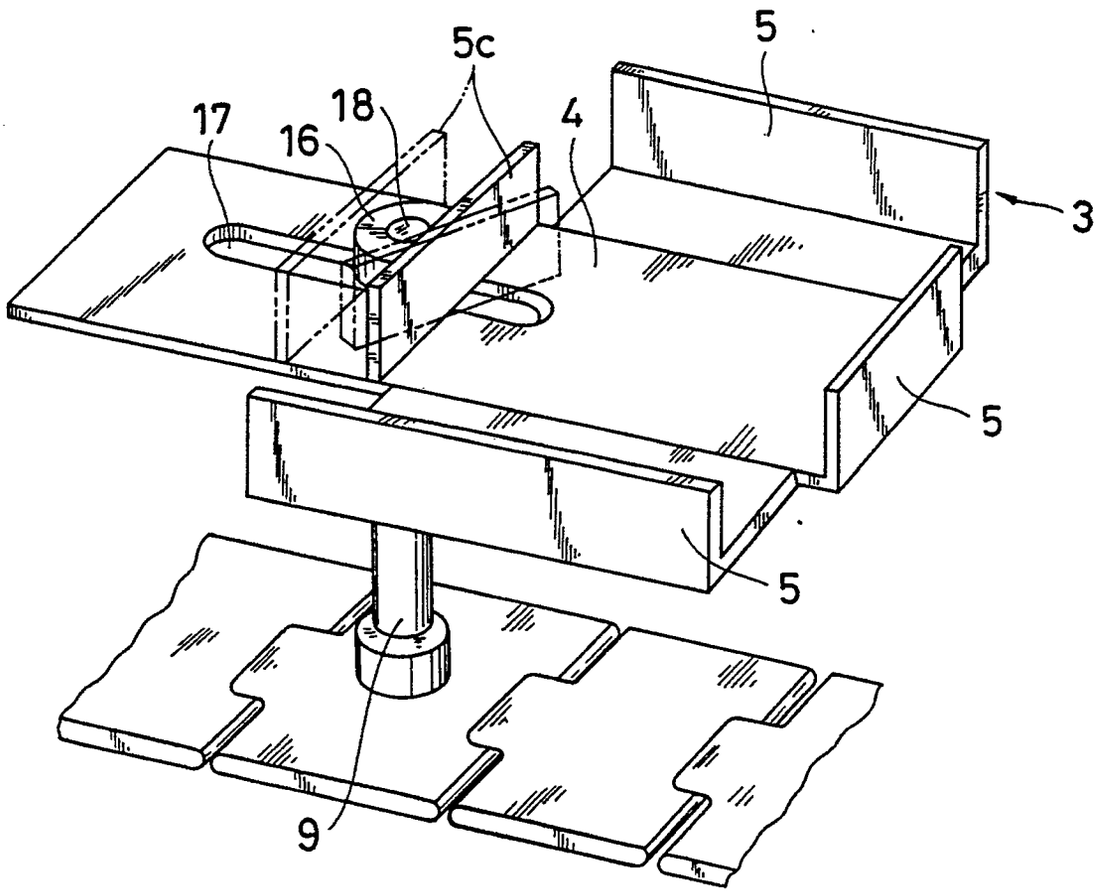


FIG. 5 (a)

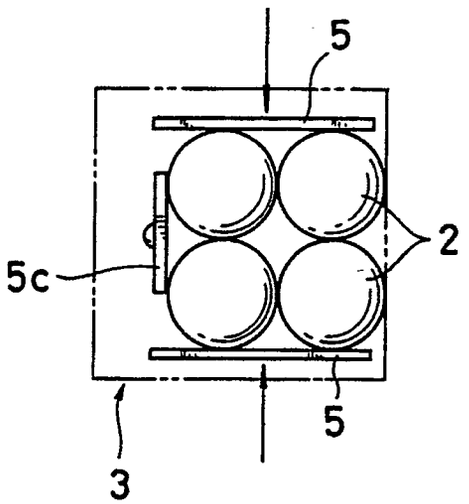


FIG. 5 (b)

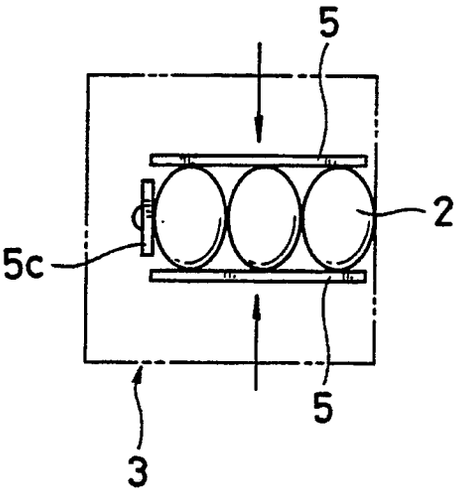


FIG. 5 (c)

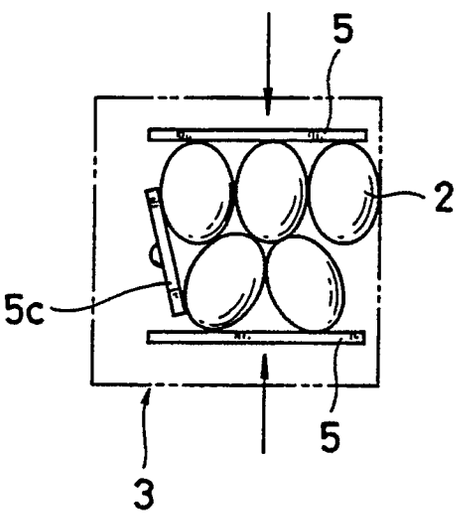


FIG. 5 (d)

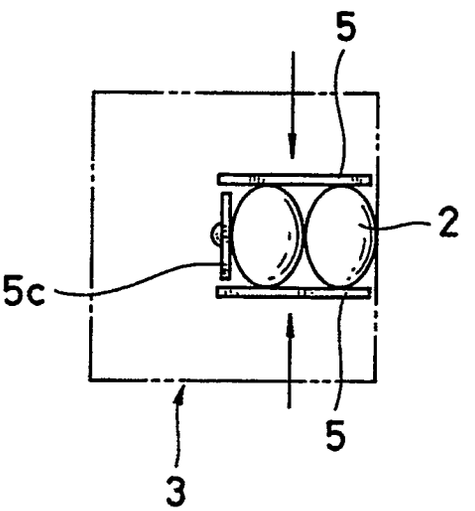
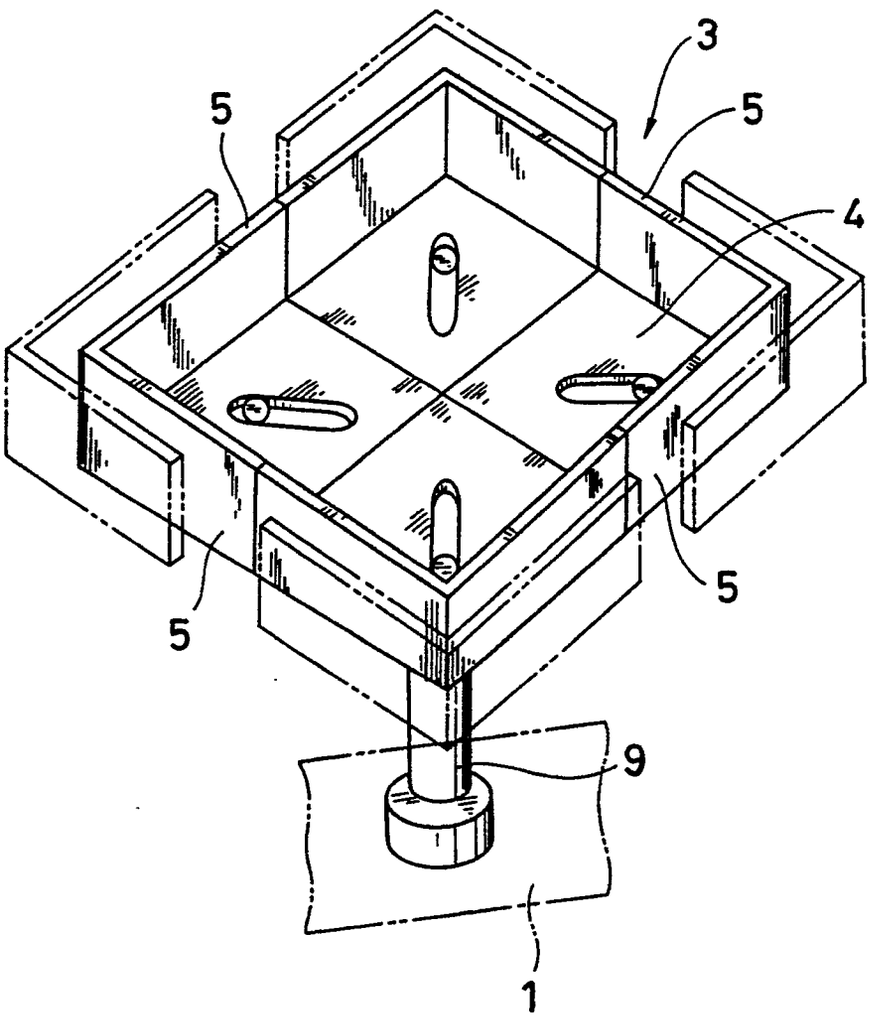


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number

EP 91 10 9297

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.5)
X,A	US-A-3 902 301 (HARKNESS ET AL.) * column 1, line 4 - line 44 * * column 4, line 13 - column 5, line 28 * * column 10, line 66 - column 11, line 30 * * figures 1,8-11 *	1,2,3	B 65 B 9/02
X	DE-B-1 303 421 (SITMA) * column 2, line 42 - column 3, line 5 * * column 3, line 18 - column 4, line 10 * * figures 1,2,5 *	1,2	
X,A	DE-B-1 247 193 (FABBRI) * column 6, line 4 - column 7, line 49 * * figures 1,2 *	1,2	
X	US-A-3 928 941 (SINGER) * column 3, line 39 - column 4, line 10 * * figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 B

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	20 August 91	SMOLDERS R.C.H.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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