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(54) **DEVICE FOR STORING AND TRANSPORTATION OF FRESH GOODS**

VORRICHTUNG ZUM AUFBEWAHREN UND TRANSPORTIEREN VON FRISCHWAREN

DISPOSITIF DE STOCKAGE ET DE TRANSPORT DE PRODUITS FRAIS

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• **US-A- 2 445 152**
• **US-A- 4 000 815**
• **US-A- 4 055 931**

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Description

The present invention concerns a device for storing and/or transporting fresh goods, for example fruit and vegetables.

Previous arrangements are known in which large storerooms are used for storing fresh goods, where a gas mixture, containing, for example, nitrogen and oxygen to inhibit the decay of the fresh goods, such as fruit and vegetables, is introduced into the storeroom under controlled conditions. These solutions, however, require specially designed premises and that the persons operating the system, and who may enter the storeroom, have sufficient protective equipment.

When such fresh goods are to be removed from the storeroom, the crates which contain the fresh goods are transported out of the storeroom by means of transportation pallets and are placed in transportation vehicles which may be equipped with a common refrigeration aggregate.

Furthermore, it is known that both natural and unnatural wastage occurs during the storage and transportation of fresh goods. The natural wastage is due to deterioration of the fresh goods during storage, if any, at the producer, transportation from the producer to the wholesaler, storage at the wholesaler and transportation to the retailer. The unnatural wastage is due to theft of goods during storage and transportation. The overall wastage is very large for some types of goods which also has an effect on the sales price at the retailer.

According to U.S. patent no. 4,055,931, devices for storing fruits in a protective atmosphere or for providing a protective atmosphere with trucks and box cars are known. These devices utilise a purge technique, to replace the air atmosphere within the container with the desired atmosphere. The desired atmosphere flows into the container and the displaced atmosphere is vented out of the container. Thus, there is a continuous mixing and dilution of the atmosphere within the container, until the original air is almost totally expelled. Because of the mixing of the atmosphere, this known method is costly, is inefficient, is wasteful of the purging gas, and requires a long time to expel the original atmosphere.

U.S. patent no. 4,055,931 further describes an apparatus for protecting perishable products comprising a flexible bag for enclosing said product, a probe for insertion into said bag after the bag is sealed, and a hose connecting said probe to a multi-positioned valve. Means for evacuating the air within the bag including a vacuum pump, and means for introducing a gas into the bag, both connected to the valve do also belong to this apparatus.

From U.S. Patent no. 2,445,152 a package for goods which are subjected to deterioration under the influence of moisture, and particularly to a package for iron or steel sheets, commonly known as black plate, is known. The package comprises two oppositely disposed pans arranged with their outer edges adjacent to each other and a sealing strip lapping said edges. Two

holes on the upper pan serve as vents through which air is removed from the package and is replaced with an inert atmosphere.

The aim of the present invention is to provide simple, safe storage and/or transportation of fresh goods, for example fruit and vegetables, from the producer to the wholesaler and on to the retailer, as well as simultaneously reducing considerably the two types of wastage, and wherein the introduction and/or evacuation of gas in the storage and/or transportation device can be executed in a rapid and convenient way.

The device as defined in claim 1 comprises closeable coupling nozzle pipes having a pointed tube-shaped part with perforations fastened to a flange coupling with an outer coupling part, wherein the flange couplings are fixed to the wrapping at the first and second place for introduction and evacuation of gas.

Gas here means any gas or gas mixture which is located inside the wrapping as a result of the atmosphere created by the fresh goods plus the gas mixture introduced.

According to the further design of the device, the wrapping is placed on a pallet during filling; the pallet serves as a base during storage and/or transportation. Alternatively, the wrapping may, during filling, take up the whole of or part of the interior volume of a container, for example a box made of cardboard material, a transportation crate or similar.

During the stated filling, the wrapping is filled with fresh goods which are already placed in another form of packaging, for example open cardboard boxes, crates or similar.

According to yet further designs of the device, in which the wrapping consists of a bag or sack, the bag/sack is closed and sealed by rolling the top of the bag/sack around a rod-like device and by maintaining the combination of the bag/sack and the stated device. Alternatively, the bag/sack can be closed by squeezing together the top of the bag/sack and sealing it by welding together the top of the bag/sack with a weld iron.

When the gas mixture is introduced into the sack, this takes place preferably via a closeable coupling nozzle pipe at the first-named place; the gas can escape via a closable coupling nozzle pipe at the stated second place.

Alternatively, the gas mixture can be introduced into the inside of the bag/sack by passing a gas-conducting probe through the sheeting of the bag/sack at the top of the bag/sack, whereby the probe is passed down to a level close to the base of the bag/sack, and the gas can escape from the bag/sack via a gas-conducting device mounted at the stated second place.

The present invention will now be explained in more detail with reference to the enclosed drawings wherein figure 10 serves to illustrate the concept of the invention; the description and the drawings should not be considered as representing the full possibilities of the present invention.

Fig. 1 shows, as an example, the transportation of

fruit from a producer to a wholesaler and on to a retailer.

Fig. 2 shows the placing of a base on a pallet, for example a Europallet.

Fig. 3 and 4 show a closeable bag/sack with fresh goods placed on a pallet.

Fig. 5, 6 and 7 show the closure and sealing of a bag/sack.

Fig. 8 shows a method according to a design for introducing a gas mixture into the bag/sack.

Fig. 9 shows the introduction of a gas mixture into several bags/sacks during storage of fresh goods.

Fig. 10 shows the design of the solution for introducing the gas.

Fig. 11 shows the sealing of the bag/sack.

Fig. 12, 13, 14 and 15 show an alternative design of a wrapping.

Fig. 1 shows, for example, apples packed in crates 2, placed on a pallet 3, where the pallet 3 with the crates 2 is then transported to a wholesaler. Then the fruit is transported, for example in the refrigerated lorry 4, to the retailer, where the consumer 5 can buy the fruit displayed at the retailer.

Figs. 2-7 show examples of wrapping in accordance with the invention for storing and/or transporting fresh goods using a bag or sack.

In order for the method in accordance with the invention to work as satisfactorily as possible, it is preferable to use a pallet such as a Europallet, 6, on top of which is first laid a sheet 7 of, for example, cardboard material as shown in fig. 2.

A bag/sack, preferably of plastic material such as plastic sheeting, is placed on top of the pallet/sheet 7 combination. Even though, under certain circumstances, it might be appropriate to fill the bag or sack when it has been pulled up into its natural shape, it will, nevertheless, be practical to fill the bag/sack 8 by laying it folded onto the pallet 6 with the stated sheet 7 between the bag/sack and the pallet, and for the fruit then to be stacked on the pallet and sheet 7, as shown in fig. 3, after which the sheeting of the bag/sack is pulled up along the outer sides of the stacked crates of fresh goods, as shown in fig. 4. The bag/sack is thus pulled up along the sides of the stack 2' of crates 2, after which the bag's or sack's plastic sheeting is folded in over the stack 2', as shown in fig. 5.

In a first design it is suggested that the bag/sack be closed and sealed in a very simple manner, namely by using a rod-like device 9, for example a cardboard tube, wooden stick or similar around which the bag's/sack's plastic sheeting can be rolled.

Fig. 6 shows in more detail how the rod-like device 9 serves as the roller for the top of the bag/sack in such a way that the bag/sack is adequately sealed when closed.

When rolled up, as shown in fig. 7, one or more clamping devices 10 are attached to the combination of the rolled-up plastic sheeting and the stated rod-like organ; the clamping devices 10 are designed to snap onto the combination of the plastic sheeting and rod

device 9, thereby preventing the sheeting rolling open by means of lugs 11 on the clamping device 10 reaching out from the circumference of the rod device and counteracting its rotation.

Fig. 8 shows diagrammatically how a gas mixture, for example nitrogen and oxygen, or carbon dioxide, possibly in combination with other gases, can be introduced into the inside of the bag/sack. In accordance with the design shown here, it is suggested that the gas mixture be introduced into the inside of the sack by means of a gas-conducting feed device in the form of a probe or similar 12 passed through the sheeting 13 of the bag/sack at the upper part of the bag/sack. Introduction of the device through the sheeting may be by direct piercing by the lower probe part, which is pointed. In accordance with the design shown the lower part of the probe may be of any length, for example from just underneath the upper part of the bag/sack to the lower part of the bag just above the pallet. This probe is thus introduced at a first place 16 on the bag/sack. A corresponding probe may be attached at a second place 17 on the bag/sack if gas is to be evacuated from the bag/sack. It may be necessary to evacuate gas from the sack if, for example, two or more bags/sacks are connected as shown in fig. 9. Here the gas is introduced through a gas feed system 19 from a gas bottle 21, while superfluous gas or gas formed by the fresh goods is evacuated through a collection system 20. Instead of having a separate evacuation or collection system, superfluous gas may be evacuated into the open air through the second probe or opening 17 (see fig. 8) or the gas may be evacuated to the open air through perforations in the bag/sack, for example in its lower part (not shown in detail in the drawings).

When the probe, as shown and described in connection with the figures, is removed, it is expedient to seal the hole left in the two places on the plastic sheeting; this can be done, for example, by means of a sealing adhesive strip, cardboard etc.

When the bag/sack arrives at the retailer in a closed, gas-filled, sealed state, the bag/sack can be ripped open, for example using a knife, or it can be opened by opening the closure device shown in figs. 6 and 7.

Fig. 8 shows, in more theoretical terms, how gas can be introduced or evacuated through a feed device in the form of a probe which pierces the sack. Fig. 10 shows a concrete and practically feasible example according to the invention, in which a pointed, tube-shaped part 22 with perforations 23 is fastened to a flange coupling 24 with an upper coupling part 25. The coupling part 25 may, for example, be the female or male part of a quick-action coupling, for example a bayonet coupling, so that the coupling pieces 26 or the hoses (not shown) for the introduction or evacuation of gas can be connected or disconnected rapidly.

The feed device or probe 22 shown here, is kept in place, after the tube-shaped, perforated part 22 has pierced the bag/sack, via a flange coupling, which is

welded or glued to the bag/sack. The flange may, for example, be provided with a layer of glue to fasten it to the bag/sack.

During transportation, in most cases it will be necessary to seal the whole bag/sack as external gas supply is usually not possible during transportation. In such a case the female or male part of the bayonet coupling 25 will serve as a locking cap so that the coupling device 27 is adequately sealed.

Fig. 11 shows how the sheeting on the top of the bag/sack can be folded together to form a longitudinal part 33, against which an existing weld iron 34, 35 is applied so that the bag/sack is sealed in an alternative manner.

Figs. 12, 13, 14 and 15 show an alternative wrapping for which a three-part solution is used, comprising a lower part 28, an upper part 29 and a lower part 30.

The lower part 28 may be a sheet or a piece of, for example, plastic sheeting which is placed on a pallet 3, as shown in fig. 12. Then, for example, crates of fresh goods are placed on the plastic sheeting on the pallet as shown in fig. 13 and the plastic sheeting is spread up so that it reaches up over and around the stack of crates on the pallet. Instead of a sheet as shown in figs. 12 and 13, an alternative solution is to use a crate-like base part, open at the top, which is placed on the pallet.

After the desired number of crates have been placed on the pallet, a sack-like hood 29, open at the bottom, is pulled down over the crates, as shown in fig. 14. Instead of a hood as shown in fig. 14, a sheet or similar of plastic sheeting may also be used, spread down over the crates in a similar manner to that shown in figs. 12 and 13. Then the upper part 29 and the other part 28 are joined by means of an adhesive stretch sheet or shrink sheet 30 as shown in fig. 15 so that a sealed wrapping is formed with properties corresponding to those of the bag/sack stated in the previous example.

After the crates of fresh goods, in this case fresh fruit, have been unpacked from the closed, gas-filled bag/sack, the crates of fruit or other fresh goods can be placed in a sales and storage display cases, where, for example, the crates 2 are placed at a slant. In order to keep the goods cool, if the retailer does not have a common refrigerated display counter as an alternative to a sales display case, a refrigeration unit can be mounted on the top of the sales display case; the underside of the refrigeration unit is provided with a number of holes and the side is provided with a number of openings into which elements of dry ice can be placed. When the dry ice elements decompose, cold CO₂ gas will trickle down over the fresh goods, refrigerate them and thereby contribute to better storage at the retailer.

For "dead" products such as meat and fish the evaporation of CO₂ will also create and maintain a controlled atmosphere around the products in the refrigerated display case.

Further designs and variations of the present invention are conceivable within the framework of the present invention as claimed.

Claims

1. Device for storing and/or transporting fresh goods, comprising a closeable wrapping being filled with or arranged around the fresh goods, having a first and a second place (16, 17) for respectively introduction and evacuation of gas into and from the wrapping, and comprising closeable coupling nozzle pipes having a pointed tube-shaped part (22) with perforations (23) fastened to a flange coupling (24) with an outer coupling part (25), wherein the flange couplings (24) are fixed to the wrapping at the first and second place (16, 17) for introduction and evacuation of gas.
2. Device according to claim 1, **characterized in that** the flange couplings (24) are fixed to the wrapping by means of welding or gluing.
3. Device according to claim 1, **characterized in that** the coupling part (25) is constituted by a female or a male part of a quick-action coupling, for example a bayonet coupling.

Patentansprüche

1. Vorrichtung zum Lagern und/oder zum Transportieren von frischen Waren, welche eine verschließbare mit den frischen Waren gefüllte oder um dieselben herum angeordnete Verpackung umfaßt, welche eine erste und eine zweite Stelle (16, 17) aufweist zwecks Einführens beziehungsweise Entleerens eines Gases hinein in die Verpackung oder heraus aus derselben, und welche ausgestattet ist mit einem verschließbaren Kupplungsstutzen der einen spitzzulaufenden rohrförmigen Teil (22) mit Perforierungen (23) aufweist und der mittels eines äußeren Kupplungsgliedes (25) an einem Kuppelungsflansch (24) angeschlossen ist, wobei die Kuppelungsflansche (24) an der ersten und der zweiten Stelle (16, 17) mit der Verpackung verbunden sind zwecks Zuführung und zwecks Entleerung des Gases.
2. Vorrichtung gemäß Anspruch 1, dadurch gekennzeichnet, daß die Kuppelungsflansche (24) über den Weg des Schweißens oder des Klebens mit der Verpackung verbunden sind.
3. Vorrichtung gemäß Anspruch 1, dadurch gekennzeichnet, daß das Kupplungsglied (25) aus einem männlichen oder einem weiblichen Teil einer Schnellverbindungs Vorrichtung besteht, zum Beispiel aus einem Bajonettverschluß.

Revendications

1. Dispositif de stockage et/ou de transport de produits frais, qui comporte un emballage apte à être

fermé, rempli des produits frais ou aménagé autour de ceux-ci, qui est pourvu d'un premier et d'un deuxième emplacement (16, 17) pour respectivement l'introduction dans ou l'évacuation hors de l'emballage de gaz, et qui comporte des tubulures d'accouplement à fermeture qui possèdent une partie effilée en forme de tube (22) avec des perforations (23) et qui sont rattachées à un accouplement à plateau (24) à l'aide d'un accessoire de couplage externe (25), dans lesquelles les accouplements à plateau (24) sont fixés à l'emballage au niveau du premier et du deuxième emplacement (16, 17) pour l'amenée et l'évacuation du gaz.

2. Dispositif selon la revendication 1, caractérisé en ce que les accouplements à plateau (24) sont rattachés à l'emballage par la voie du soudage ou du collage.
3. Dispositif selon la revendication 1, caractérisé en ce que l'accessoire de couplage (25) est constitué d'une partie femelle et d'une partie mâle d'un raccord rapide, comme par exemple un accouplement à baïonnette.

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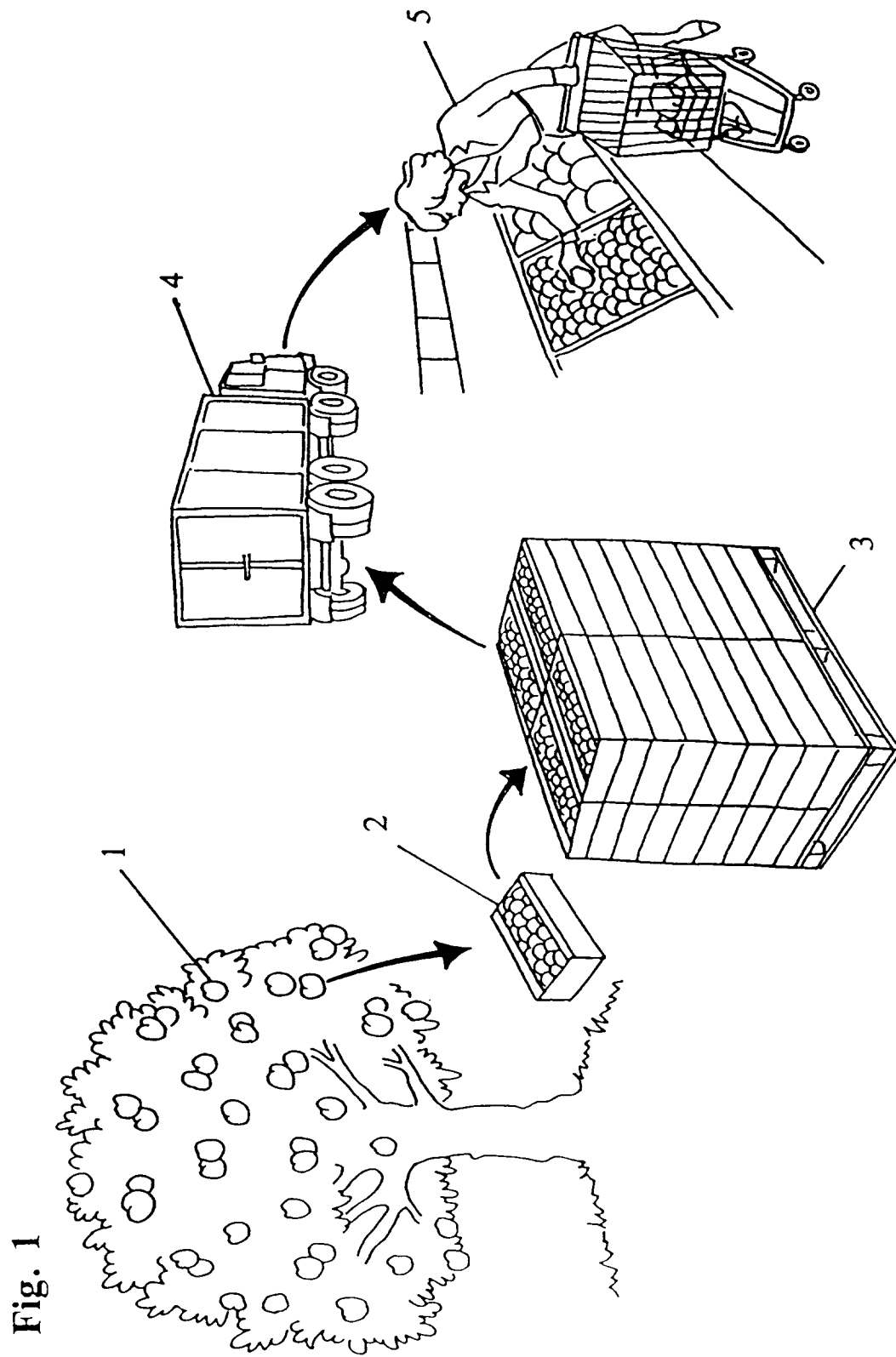


Fig. 2

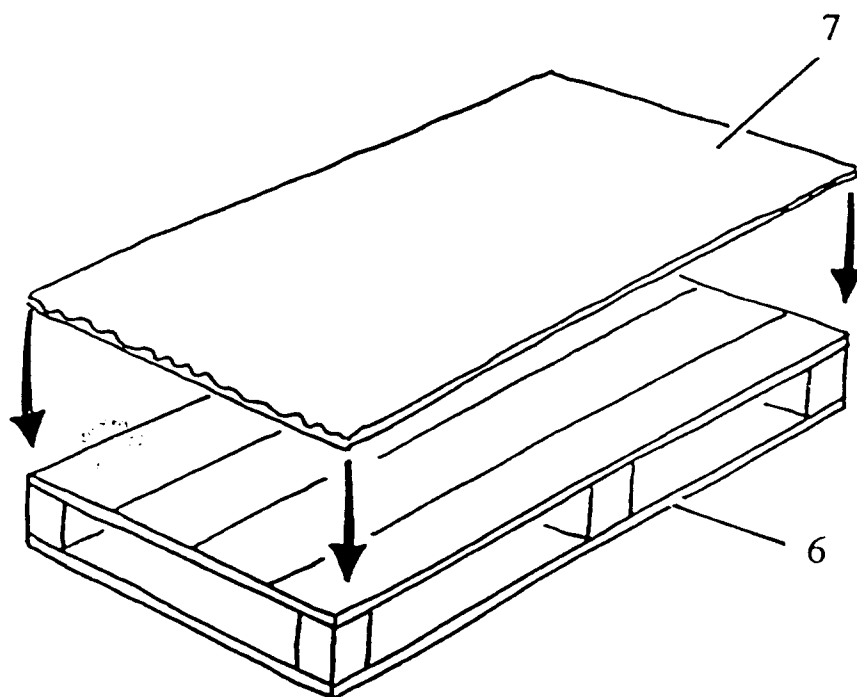


Fig. 3

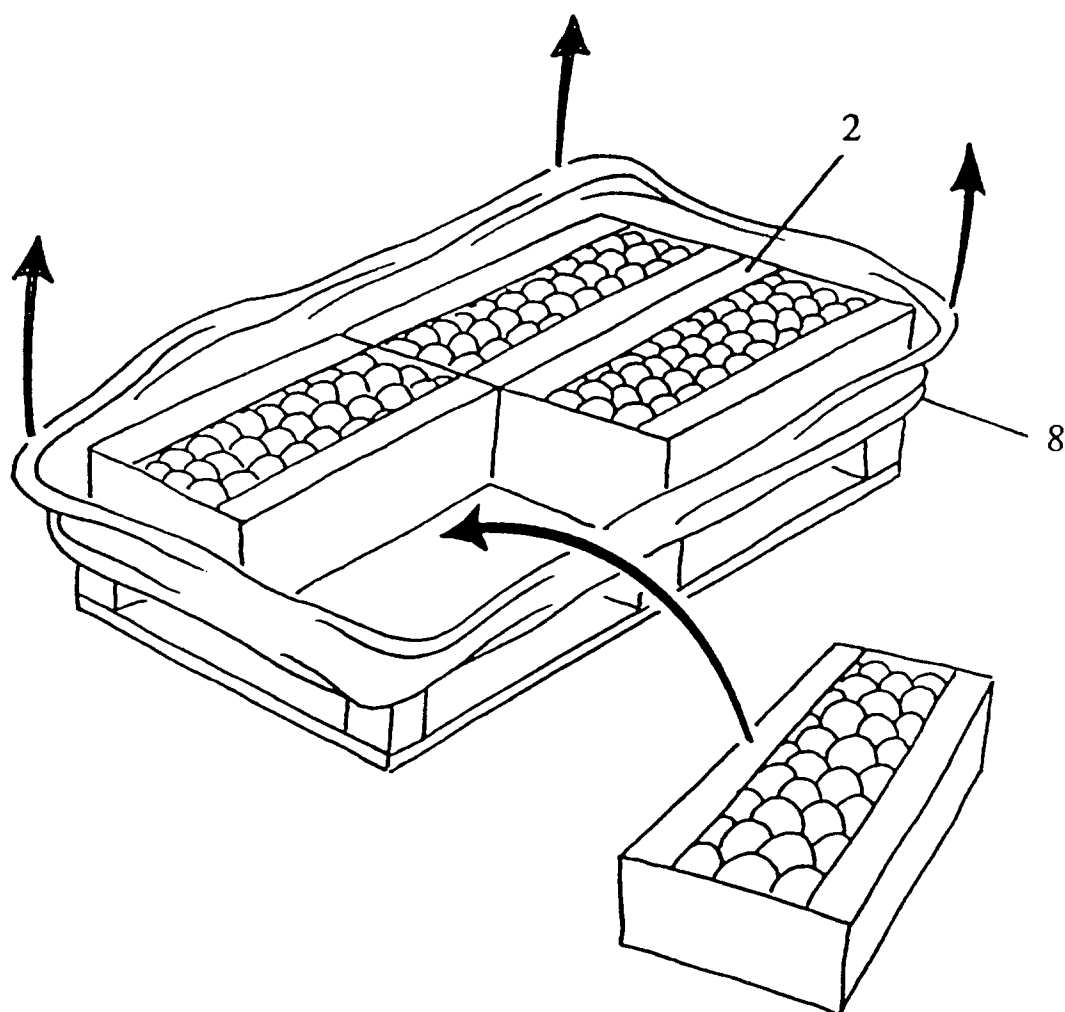


Fig. 4

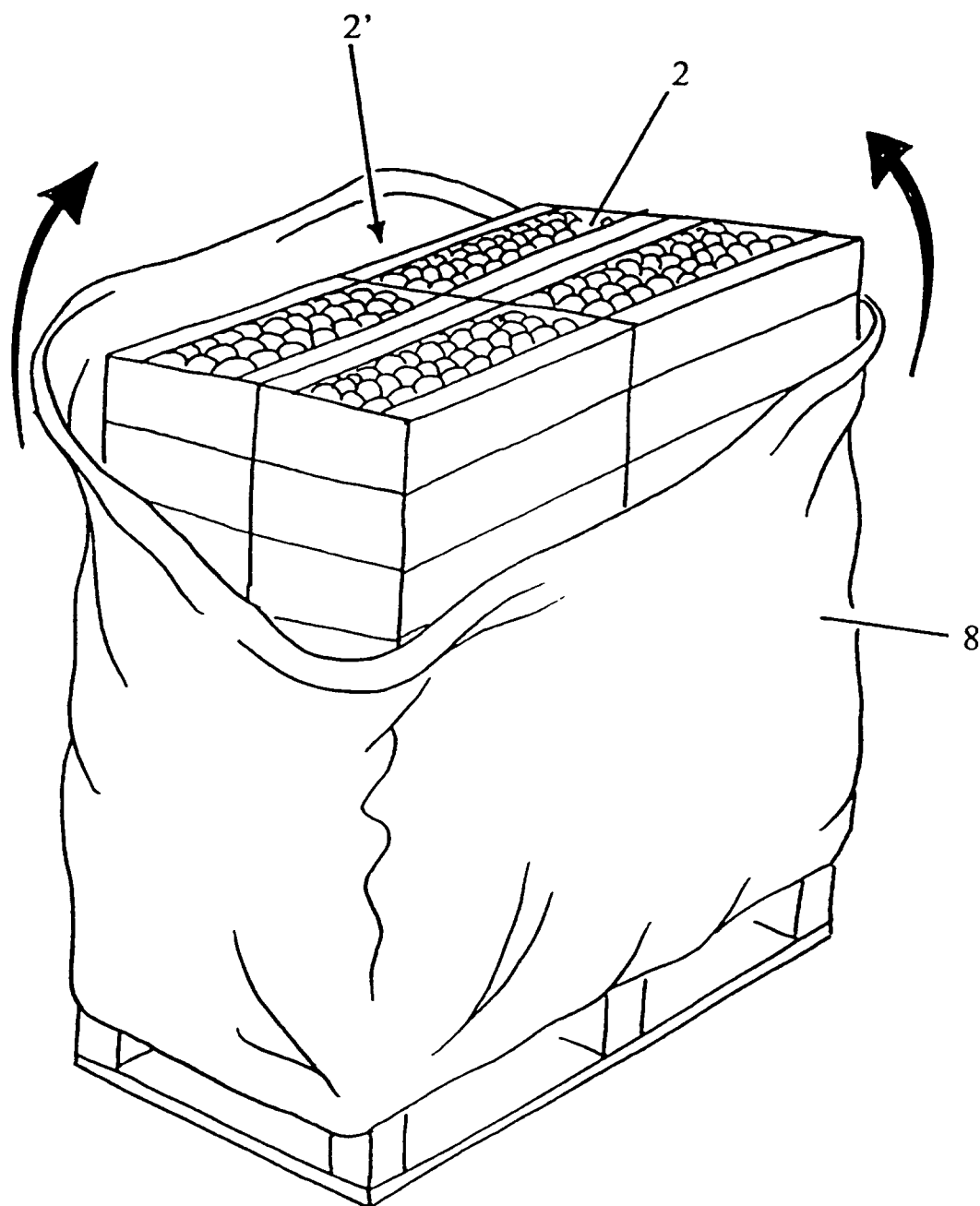


Fig. 5

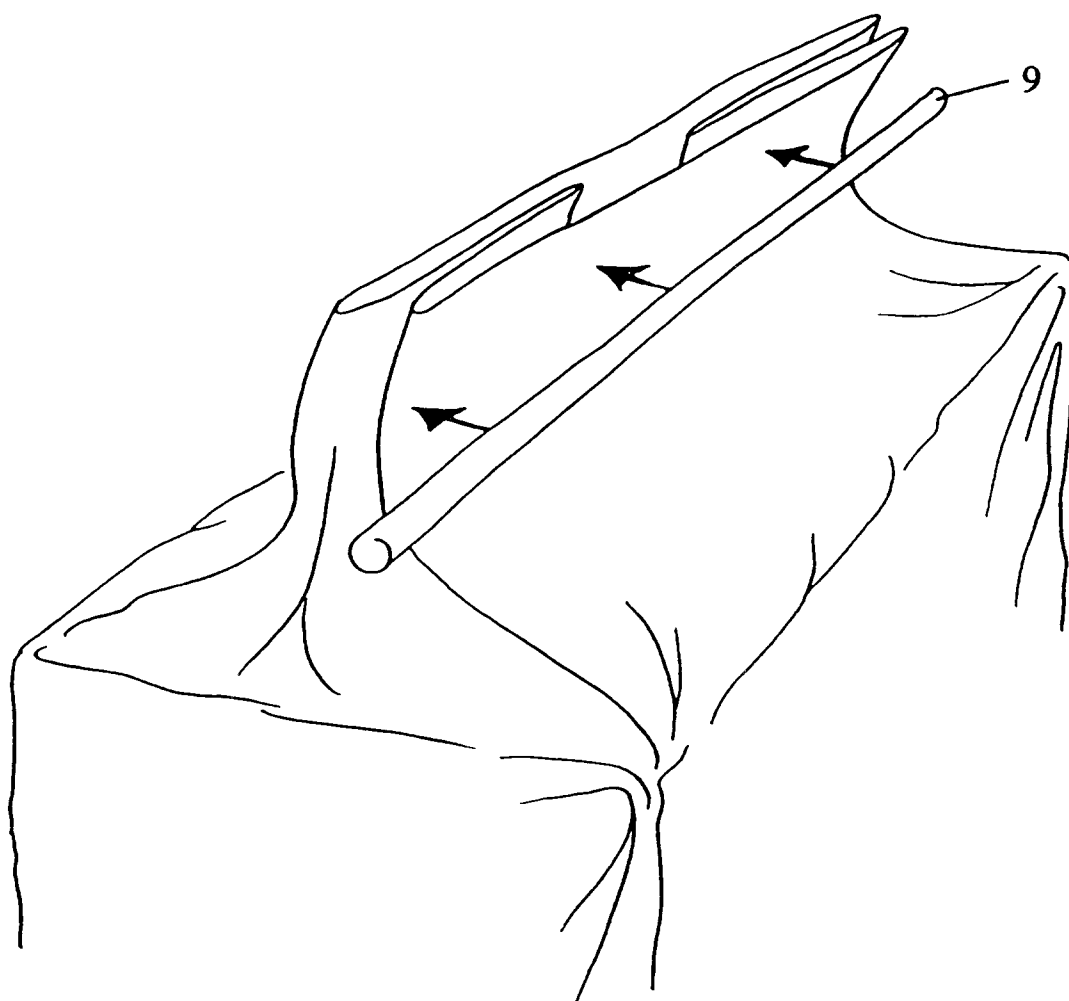


Fig. 6

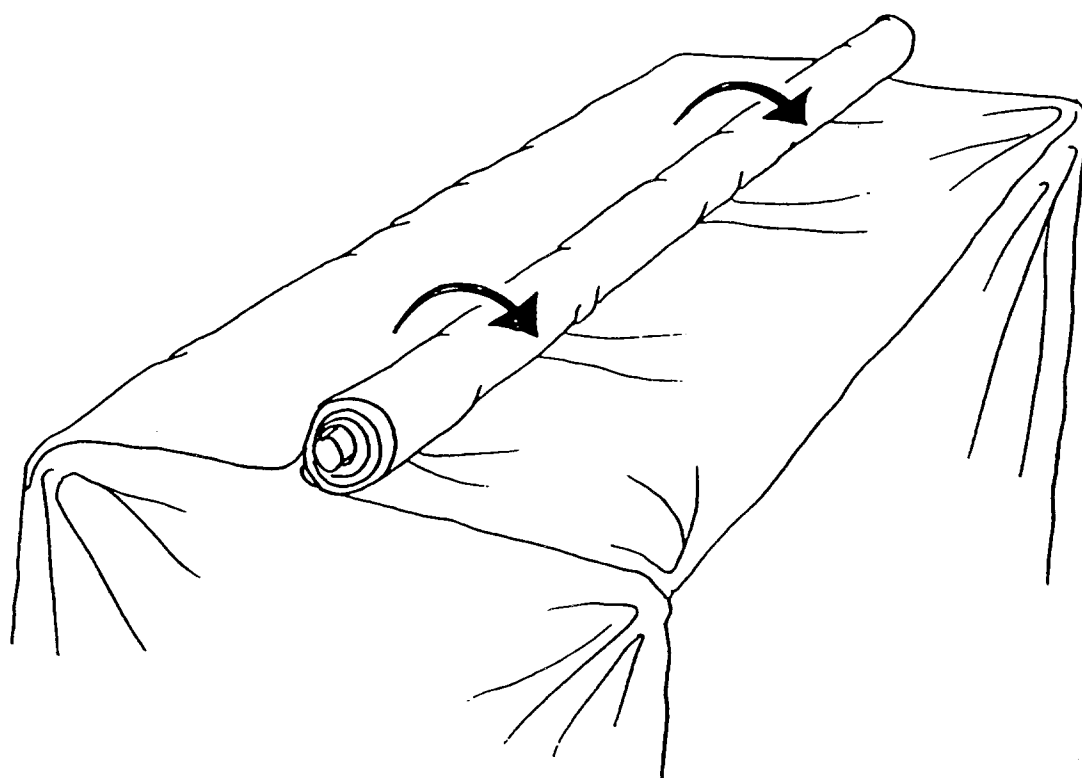


Fig. 7

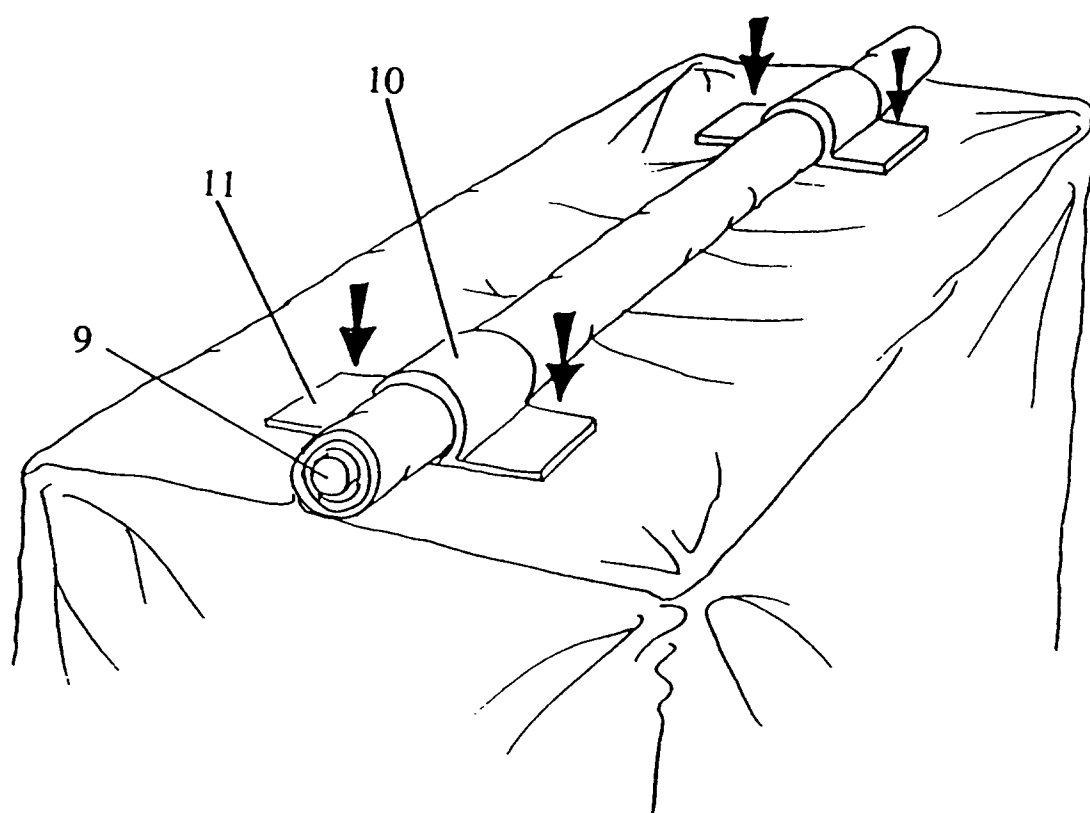
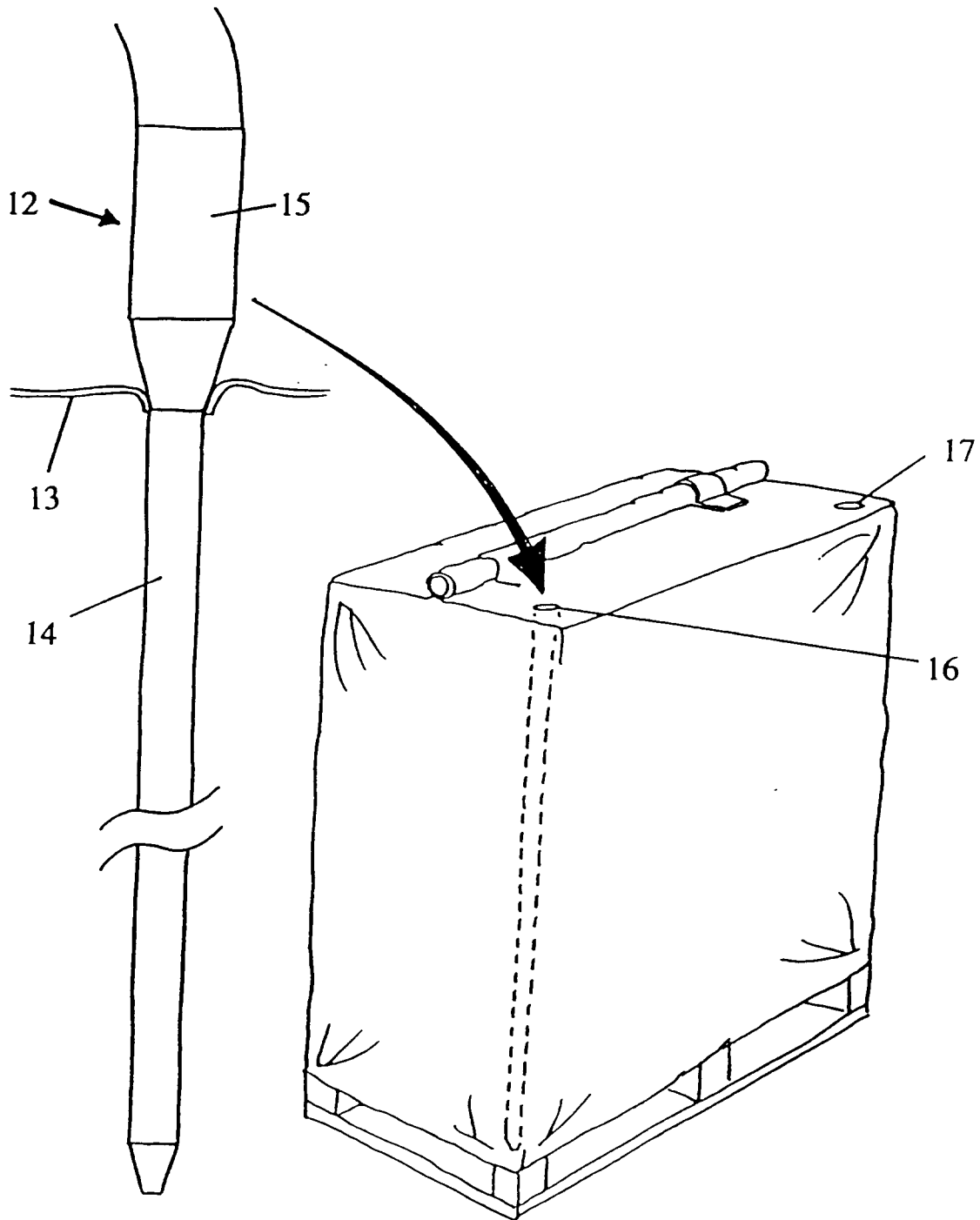


Fig. 8



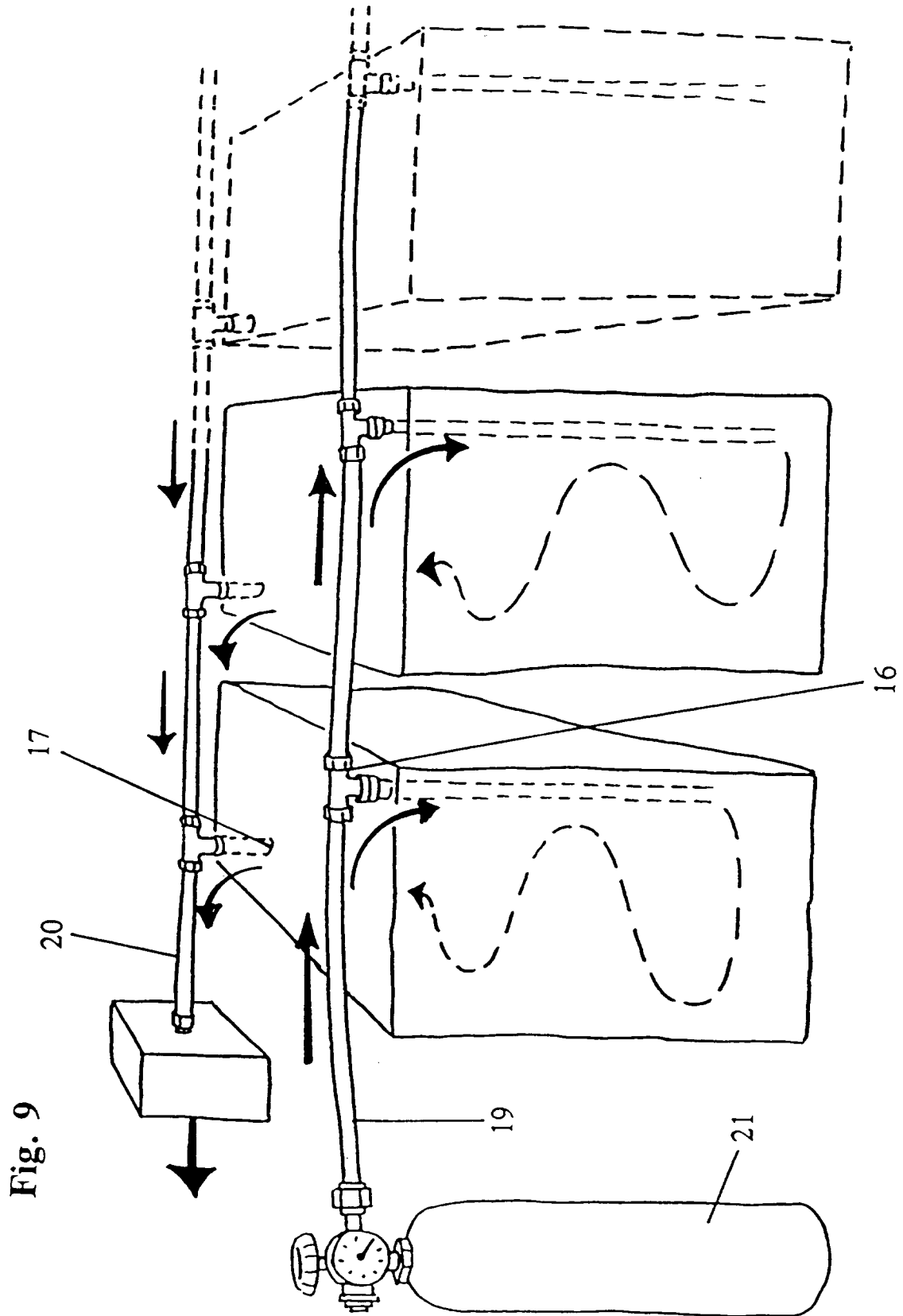


Fig. 9

Fig. 10

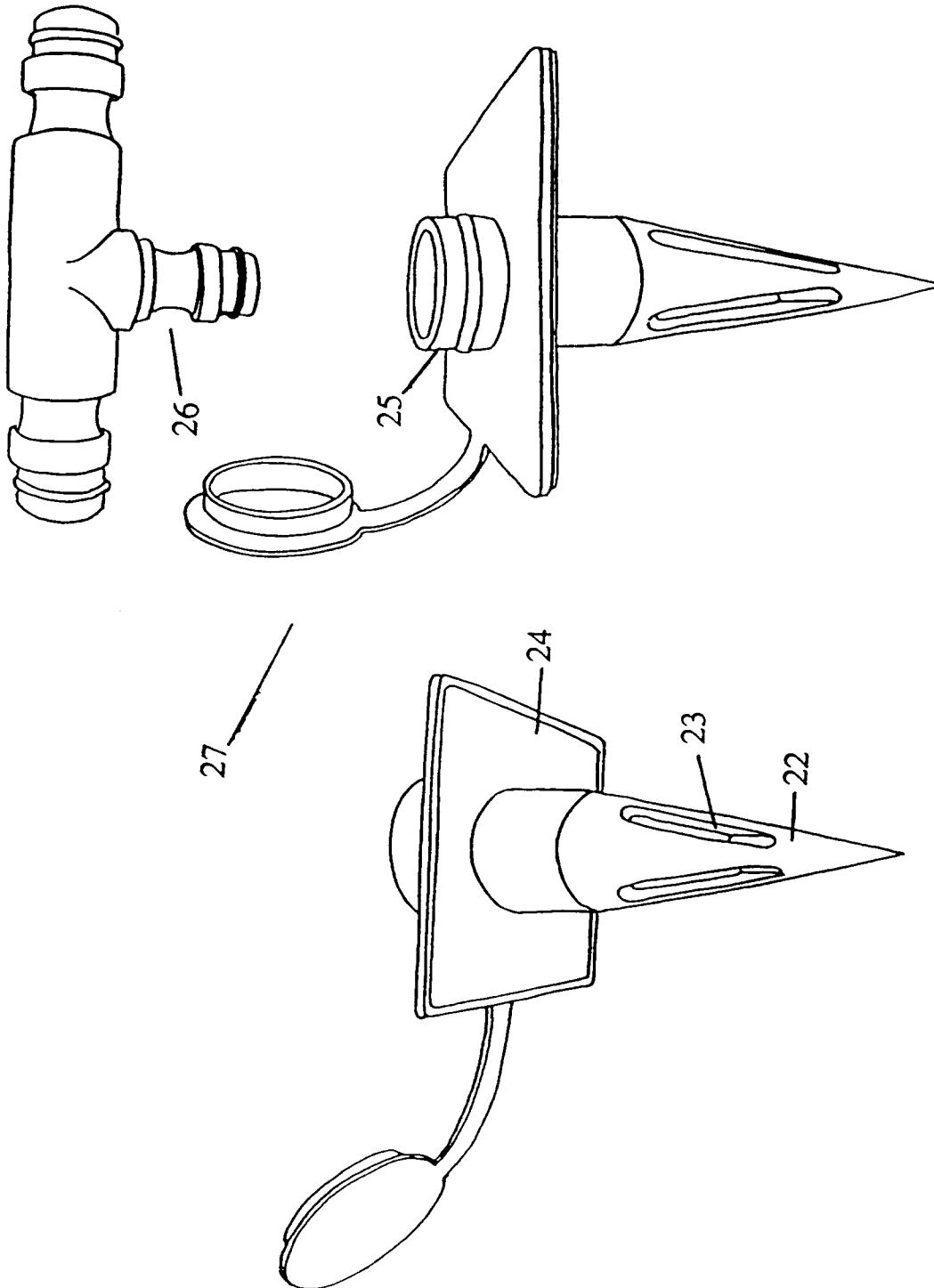


Fig. 11

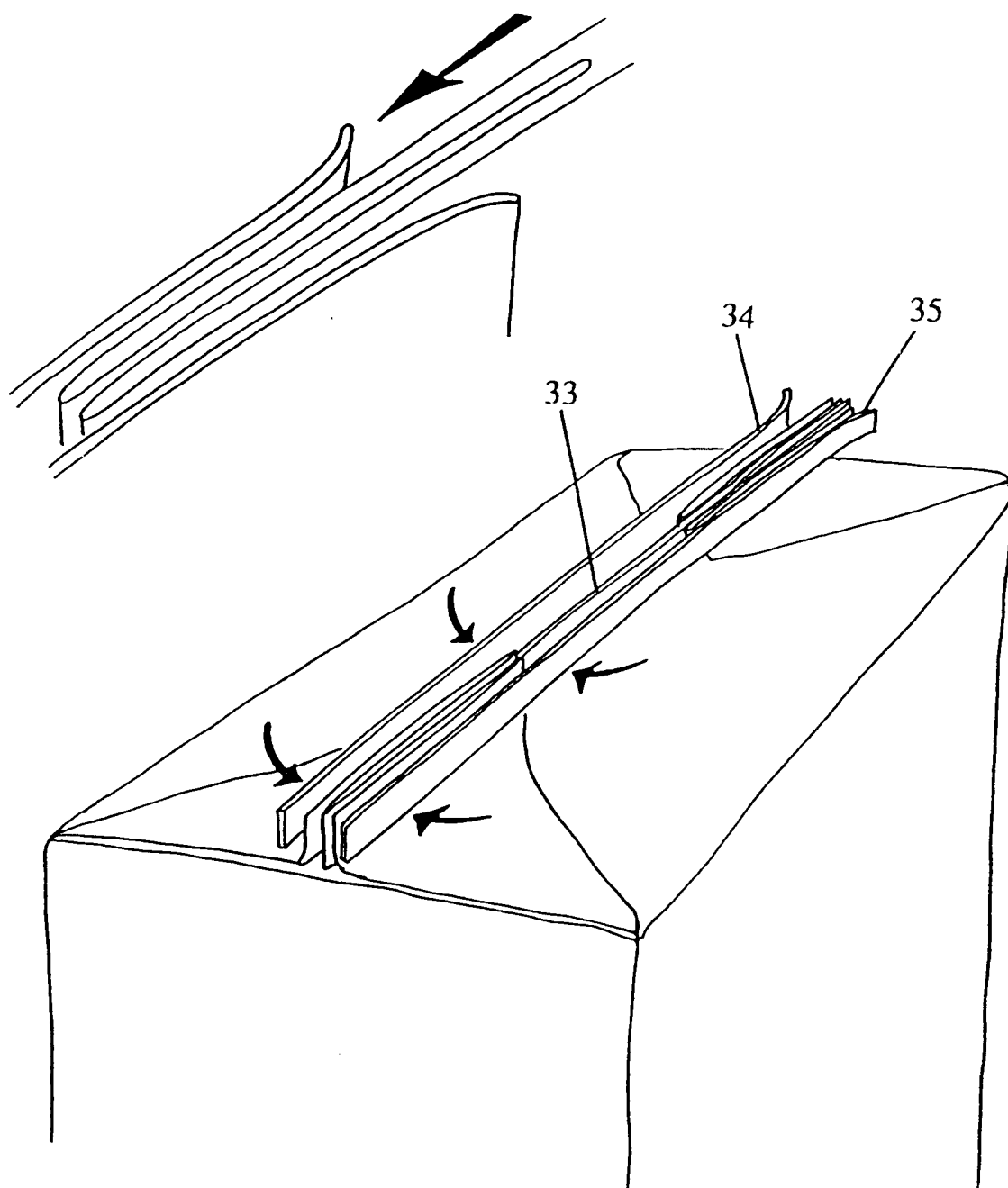


Fig. 12

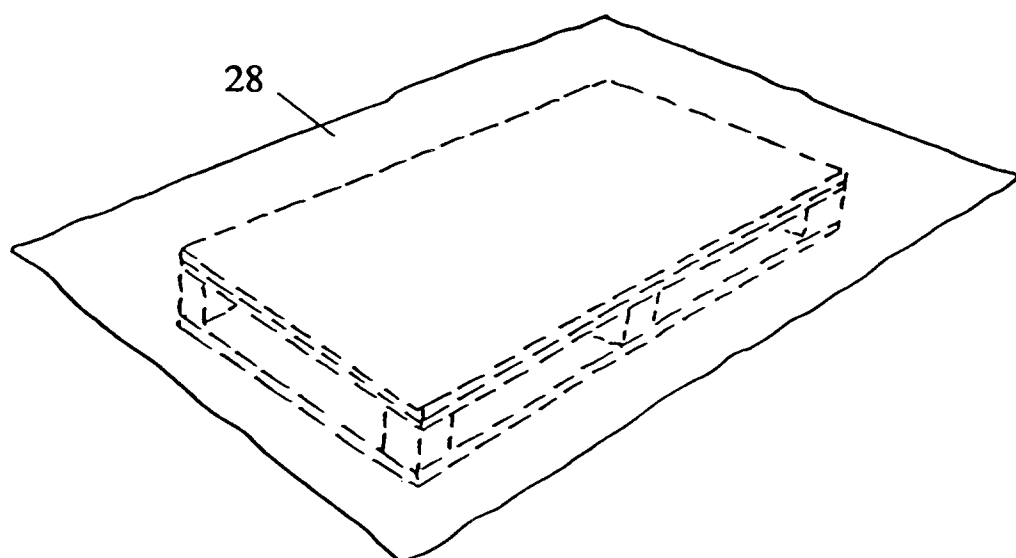


Fig. 13

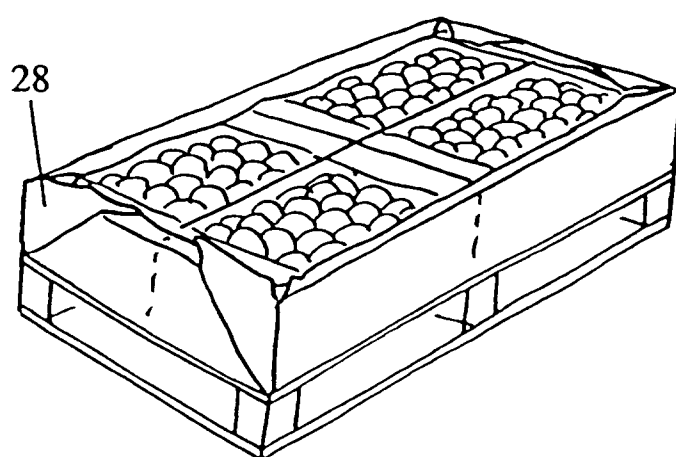


Fig. 14

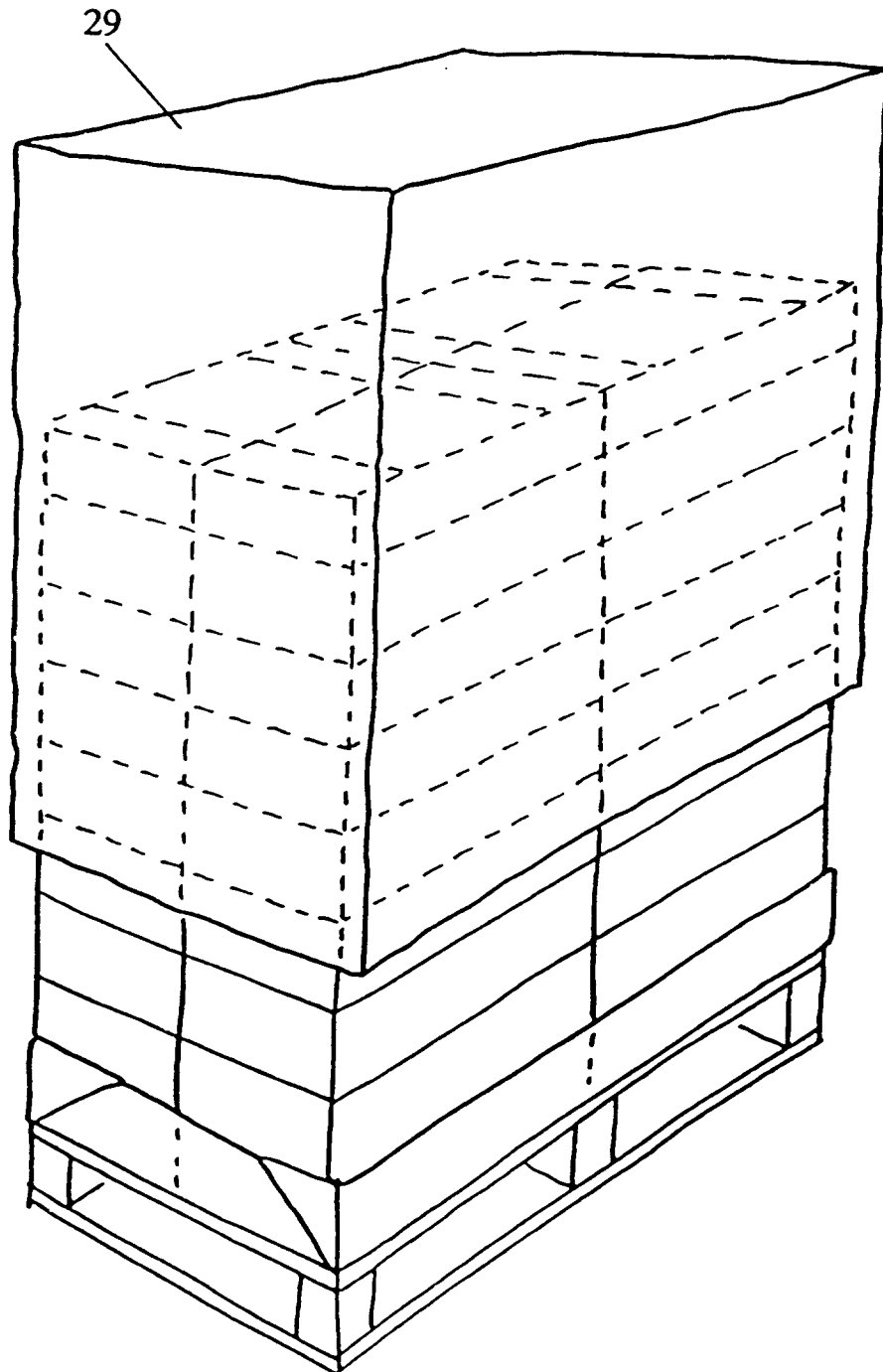


Fig. 15

