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Packaging.

(57)

A method of packaging a product comprises the steps of forming an envelope 50 and inserting the product into the envelope, the envelope being such that the product can be made use of without having subsequently to handle the product. For example, where the product is a toilet cleaner and/or freshener, the product and the envelope may be water soluble so that the product can be placed in the cistern of a toilet without any need to remove the envelope first.

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Packaging

The invention relates to packaging and particularly, but not exclusively, to the packaging of household products such as toilet cleaners and/or fresheners, air fresheners, and the like.

Many such products are unpleasant to handle and can, for example, stain the skin and/or leave a strong odour on the skin. They are therefore difficult to pack for the manufacturer and difficult to unpack for the customer.

We have now discovered a method of packaging which is highly versatile and does not require either manufacturer or customer to handle the product.

Accordingly the invention provides a method of packaging a product, e.g. a household product, comprising the steps of forming an envelope, inserting the product into the envelope, preferably in liquid form, and sealing the envelope, the envelope being such that the product can be made use of without having subsequently to handle the product.

The envelope can be of any shape.

Where the product is for solution in water, e.g. a toilet cleaner and/or freshener, the envelope may be water soluble so that the envelope can simply be placed by a customer in a toilet cistern.

The water soluble envelope may be protected from moisture in the atmosphere before use by a removable wrapping e.g. a tear-off label or labels.

Alternatively, and particularly when the product is an air freshener or the like, the envelope may have perforations which, when the product is inserted into the envelope, are closed, for example by a label or labels which can subsequently be removed by the customer to expose the holes.

if the product is inserted in liquid form, it can be squirted into the envelope from a nozzle without any need for handling of the product.

A first aspect of the invention concerns water treatment products, such as those which are placed in the cistern or bowl of a water closet for freshening, cleaning and/or disinfecting purposes.

Up to now the manufacture of such products has been slow, and labour intensive, requiring filling of a plurality of moulds with a settable fluid water treatment composition, passage of the moulds through a long refrigerated tunnel to set the composition, then manual removal and wrapping of the solid product. These water treatment products are frequently bright blue, and it is found in practice that the buildings used for manufacture, as well as the clothes and skin of the workers, become coated with the blue mixture. Thus the working conditions are extremely unpleasant.

The existing methods have been in use for many years but according to this embodiment of the invention, the manufacture of water treatment products requires a considerably reduced work-force, improves the working conditions, requires no moulds, no refrigeration, and no wrapping and produces a product which can be handled without soiling the hands, yet which requires no unwrapping prior to use.

According to this aspect the method of manufacturing a water treatment product comprises the steps of forming a water soluble envelope, inserting a settable fluid water treatment composition into the envelope, sealing the envelope, allowing the product to set thereby providing a water treatment product having an airtight water soluble skin so that the water treatment product may be handled without soiling the hands or releasing the odour of the product.

The envelope may be of water soluble plastics material.

Preferably the envelope is formed by sealing together two layers of water soluble plastics material.

Preferably a plurality of envelopes is formed simultaneously by sealing together two layers of water soluble plastics material. The fluid water treatment composition may then be injected into a plurality of envelopes simultaneously through a plurality of nozzles.

Two continuous layers of water soluble plastics material may be used, the layers being positioned one on each side of a plurality of parallel spaced-apart injection nozzles, a plurality of heaters being used to seal the layers together to form a plurality of tubes, each containing a nozzle, a heater extending transversely of the nozzles, below the nozzles, being used to make a transverse seal thereby forming a first set of envelopes, the water treatment composition then being injected into each envelope of the set, the filled envelopes being drawn away from the nozzles, and a further transverse seal being made to seal the first set of envelopes hand form the first seal of a second set of envelopes.

Cutting wheels may be used to form lines of weakness in the form of lines of perforations or slits between adjacent tubes.

The transversely extending heater may incorporate a knife, the knife being adjustable so that it can cut completely through the sealed layers to separate a set of sealed envelopes, or can partially cut through the sealed layers to provide a line of weakness separating a set of envelopes from the next set of envelopes.

In order to prevent moisture in the atmosphere from affecting the film and perhaps making it become tacky before use, the envelope may be provided with a protective air impermeable covering, for example in the form of a paper label or labels which a customer can readily remove before placing the envelope in a toilet cistern.

Preferably the outer covering is applied to the envelope as part of an on line process.

For example as the envelope is formed from plastics material layers of paper may be drawn from supply rolls and may be stuck together to sandwich the envelope therebetween.

The outer covering preferably bear information such as the name of a manufacturer, advertising material, and/or instructions for use. The position of the labels may be synchronised with the position of the associated envelopes either by photoelectric registration means or mechanical registration means, for example employing perforations and gear teeth.

Instead of using a water permeable film, the envelope may be formed from material which has perforations therein, the perforations initially being covered by one or more tear-off labels. When a customer desires to use the product, it is only necessary to tear off the labels and place the product in a toilet cistern. The product will then gradually dissolve into the water through the perforations.

The period of time for which the product will function may be regulated by appropriate selection of the number of perforations. It may for example be possible for a customer to purchase a one week product, a two week product, and so on as desired.

Yet another possibility is for the envelope to be constructed so that it can be ripped open by a customer, to allow the product to fall into the toilet cistern.

Each envelope, for example as part of the on line system, may be provided with means for suspending it in a toilet cistern, for example an eyelet to enable it to be hung on a projection, or an adhesive pad (e.g. initially projected by a tear-off strip) by means of which the envelope may be stuck to the side of a cistern.

Manufacture of the product as described in the above embodiment obviates the need for a rigid mould, since the envelope itself forms the mould, and the method is therefore less expensive, labour-saving, and less messy than known methods.

Instead of simply being a wrapping, the envelope becomes an integral, functional part of the product.

When the envelope is provided with an outer paper covering, this provides the manufacturer with considerable flexibility as regards brand names. Many manufacturers of household products are

asked to produce products for different retail outlets, bearing different brand names. To print the envelopes themselves requires a sophisticated printing process which is relatively costly. However by applying an outer paper covering, printing costs can be considerably reduced, since it is much easier to print on to paper.

Another aspect of the invention relates to air fresheners.

Conventionally, some air fresheners comprise a gel which is moulded in a rigid container provided with a cover which can be removed or partially opened.

According to this aspect of the invention an air freshener gel is moulded into an envelope as the envelope is formed, in a similar manner to the first aspect, the envelope being perforated and the perforations being covered by a tear-off label. The perforation may for example be in one face only of the envelope.

The customer has only to remove the label and the air freshener gel will then emit a vapour which will gradually permeate into the atmosphere through the perforations.

As with the previous aspect, the envelope may be provided with means for mounting the envelope, for example an eyelet or adhesive pad.

Once again the number of perforations may be used to regulate the period of time for which the air freshener will be active.

By way of example, a specific embodiment of the invention will now be described, with reference to the accompanying drawings, in which:-

Figure 1 illustrates one method of manufacturing a household product according to the invention, looking at the front of the apparatus used to carry out the method.

Figure 2 is a side view of the apparatus shown in Figure 1;

Figure 3 is a perspective view of the upper part of the apparatus shown in Figures 1 and 2; and

Figure 4 is a perspective view of the packaged product.

Referring to Figures 1 to 3, there is illustrated a method of forming packages of eight products, using a continuous process commencing with a single continuous sheet of polythene and a fluid mixture.

A continuous sheet of water soluble plastics material 10 passes a storage reel (not shown) over a V-shaped plate 11. At the apex of the V a blade 12 slits the sheet of plastics material on its centre line and each half of the sheet is wrapped around the plate 11 so that it changes direction through 90°. The two halves 13 and 14 travel away from one another, pass around rollers 15 and 16 respec-

tively, and then travel towards one another again. They pass over rollers 17 and 18 respectively, and then travel downwardly, face-to-face, a slight distance apart.

The rollers 17 and 18 are spaced sufficiently far apart to permit a set of eight injection nozzles 19 to lie between the two separate facing sheets of plastic material. Only one of the tubes 19 is shown in Figure 3 for the sake of simplicity. Positioned below the roller 17 are nine pairs of heaters, each pair comprising a front heater 20 and a rear heater 21. The pairs are spaced apart across the width of the sheets of plastics material, there being one pair lying on each side of each tube 19. Each rear heater 21 is reciprocable towards and away from its associated heater 20. As shown in Figure 2, the adjacent faces of the heaters are chamfered at 22 so that they contact the plastics material only over a narrow vertically extending region.

Below the heaters 20 there are six cutting wheels 23 each co-operating with a backing roller 24. The wheels are spaced apart across the width of the plastics sheets in two groups of three, with a slitting knife 24 positioned between the two groups. Each cutting wheel 23 is bevelled to give a sharp cutting edge 25 but the cutting edge is interrupted periodically by notches 26. The injection nozzles 19 extend to just below the cutting wheels 23.

Below the cutting wheels 23 is a transversely extending heater comprising a front heater 27 and a rear heater 28. The heaters 27 and 28 are reciprocable towards and away from one another and are also movable between the position shown and a lower position shown in dotted lines in Figure 1. The heater 27 contains a knife 29 with a serrated edge which is movable into a slot 30 in the facing heater 28.

The object of the heaters 20 and 21 is to form the two sheets of plastics material into a series of parallel tubes, each tube containing one of the injection nozzles 19. In the position shown in the Figures the heaters 21 have just moved towards the heaters 20 to clamp the plastics material together and form a series of vertically extending parallel seals. Below the heaters 20 and 21, the plastics material has already been formed into tubes by earlier movements of the heaters 20 and 21. While the heaters 20 and 21 are making their seal, the heaters 27 and 28 move to their upper position and close to form a transverse seal extending across the width of the plastics material. This transverse seal forms the set of tubes into a set of envelopes open only at their upper ends. The knife 29 also performs a cutting or perforating function as described below.

After the transverse seal has been formed, a fluid mixture is injected into each of the envelopes through the associated nozzle 19. The heaters 27 and 28, which are still gripping the plastics material, are then moved to their lower position, drawing the plastics material downwardly and drawing more of the continuous sheet 10 into the apparatus. Before the heaters 27 and 28 move downwardly the upper heaters 21 have moved away from their associated heaters 20 to free the plastics material. When the heaters 27 and 28 reach their lower position, they open and then travel upwardly to their upper position where they close to make a further transverse seal.

The central slitting blade 24 severs the plastics material down the middle of the central seal so that the eight attached tubes become two sets of four attached tubes. At the same time the cutting wheels 23 from vertical cuts in the centre of the seal between adjacent tubes. Because of the notches in the cutting wheels, they do not perform a continuous cut but perform a cut which is interrupted by small bridges 31. In each set of four tubes therefore, the tubes of the set are separated by lines of weakness.

On every first cut, the blade 29 moves sufficiently far into the slot 30 to cut completely through the plastics material. On every second cut, it does not move so far, and only perforates the plastics material in the centre of the transverse seal. Thus in Figures 1 and 2 there is shown a lowermost cut edge 32, and a perforated line of weakness 33. The knife 29 is about to make a further complete cut, therefore cutting off sixteen products 34. The products are arranged in two separate packs of eight, and each product comprises a water soluble mixture within an air tight water soluble skin. Because all the cuts are made through the centre of the seals, part of a seal is left on each side of a cut, and the envelopes containing the mixture are not punctured by the cuts. Each product can be separated from the other products of the pack by tearing along the lines of weakness and can then be handled and placed in a fire without dirtying the hands or releasing the odour of the mixture.

In order to reduce the risk of the nozzles 19 becoming clogged, a mixture with a very slow setting time is used, of the order of twenty-four hours. The packages of products which are cut off on every second cut of the knife 29, are removed, e.g. by a conveyor, and are stored until the mixture has set within the sealed envelopes. The products are then ready for sale.

The mixture is mixed in a hopper 40, shown in Figure 3. The ingredients of the mix are fed to the hopper through pipes 41 and 42. The supply of mixture is controlled by a float-operated valve with-

in the hopper 40, which maintains the level of mixture in the hopper 40 at a constant level. At the base of the hopper 40 there is a pump 43 which pumps the mixture to an adjustable metering pump 44. At the appropriate point in the cycle, the metering pump 44 pumps an appropriate charge of the mixture to a manifold 45 and thence through eight pipes to the eight nozzles. Only one of the pipes 46 is shown in Figure 3 for the sake of simplicity. Each time a charge of the mixture is pumped by the metering pump 44, a charge of acid catalyst is squirted into the hopper 40 through the pipe 41.

Figure 4 illustrates four of the products 50 which can be separated from one another by tearing the envelopes apart along lines of weakness 51. The product may for example be a toilet cleaner and/or freshener. Since the envelopes are water soluble the product can simply be placed by a customer in a toilet cistern without the customer having to handle the product itself at all.

The invention is not restricted to the details of the foregoing embodiments. For example the embodiment need not comprise packs containing a plurality of envelopes. The method may be arranged to produce a plurality of individual, separate envelopes which can be bought one at a time. The first aspect of the invention may be used to produce not only a toilet cleaner and/or freshener, for example a blue block or a bleach block, but also other water treatment products.

The invention may be used to package pesticides and/or insecticides. They may for example be packaged in a permeable or perforated envelope which is initially covered by one or more tear-off labels. The envelope may have means for attaching it to a tree or plant where the pesticide and/or insecticide can gradually dissipate itself from the envelope to carry out its function.

It is not essential for the front of an envelope to be of the same material as the back of an envelope.

Although the invention is particularly well adapted to the uses mentioned above, it may have many other uses, including, for example, in the following fields: cosmetics; toiletries; pharmaceuticals; medical products; foods; other household, cleaning or janitorial products; car care; DIY; fire products, chemicals; hobby/leisure products; horticulture/agriculture; dyes/inks/pigments; flavours/fragrances/essences; building products; toys; machine/office equipment products; and sports products.

The invention includes products when manufactured by the method according to the invention.

Where the method involves the production of a series of envelopes side by side, it is not essential that each envelope contains the same product. For example, a bank of suitable delivery pumps with a

bank of supply nozzles may be used to fill a series of different products side by side into a plurality of envelopes. Thus a customer may for example be able to buy a self-contained pack which comprises a series of envelopes each containing a different product.

Claims

1. A method of packaging a product comprising the steps of forming an envelope and inserting the product into the envelope, characterised in that the envelope is such that the product can be made use of without having subsequently to handle the product.

2. A method as claimed in claim 1, in which the product is inserted into the envelope in liquid form and sets within the envelope.

3. A method as claimed in claim 1 or claim 2, in which the product is for solution in water and the envelope is water soluble.

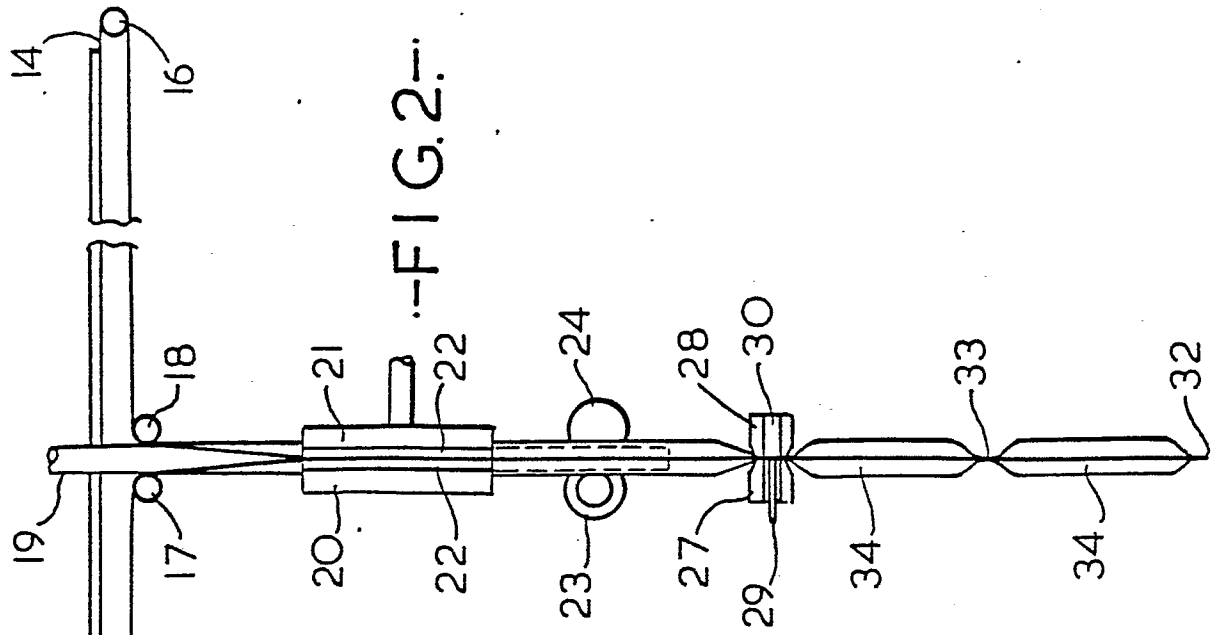
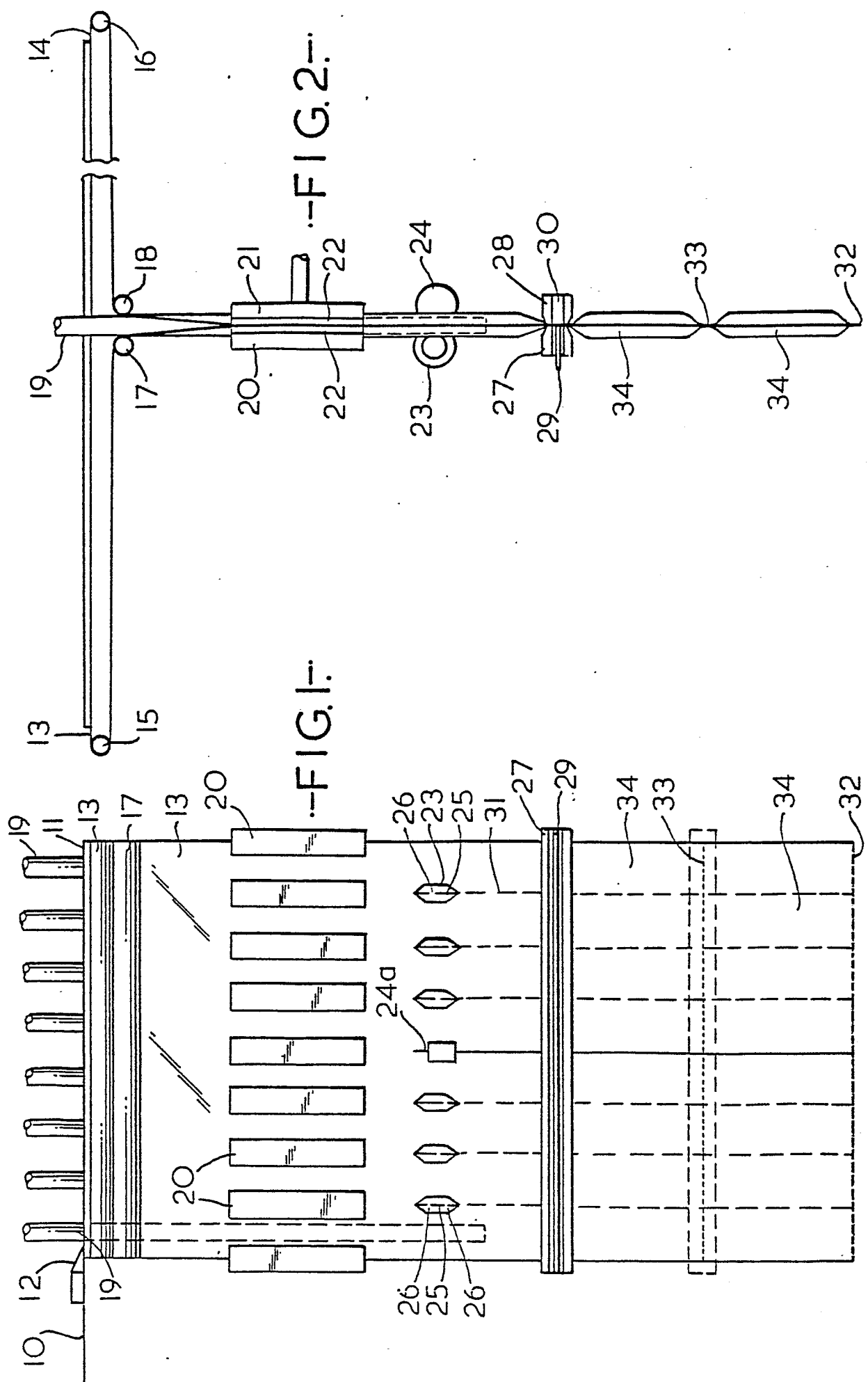
4. A method as claimed in claim 3, in which the envelope is protected from moisture in the atmosphere by a removable wrapping.

5. A method as claimed in any one of the preceding claims, in which the envelope is perforated, the perforations being initially closed by a removable label or labels.

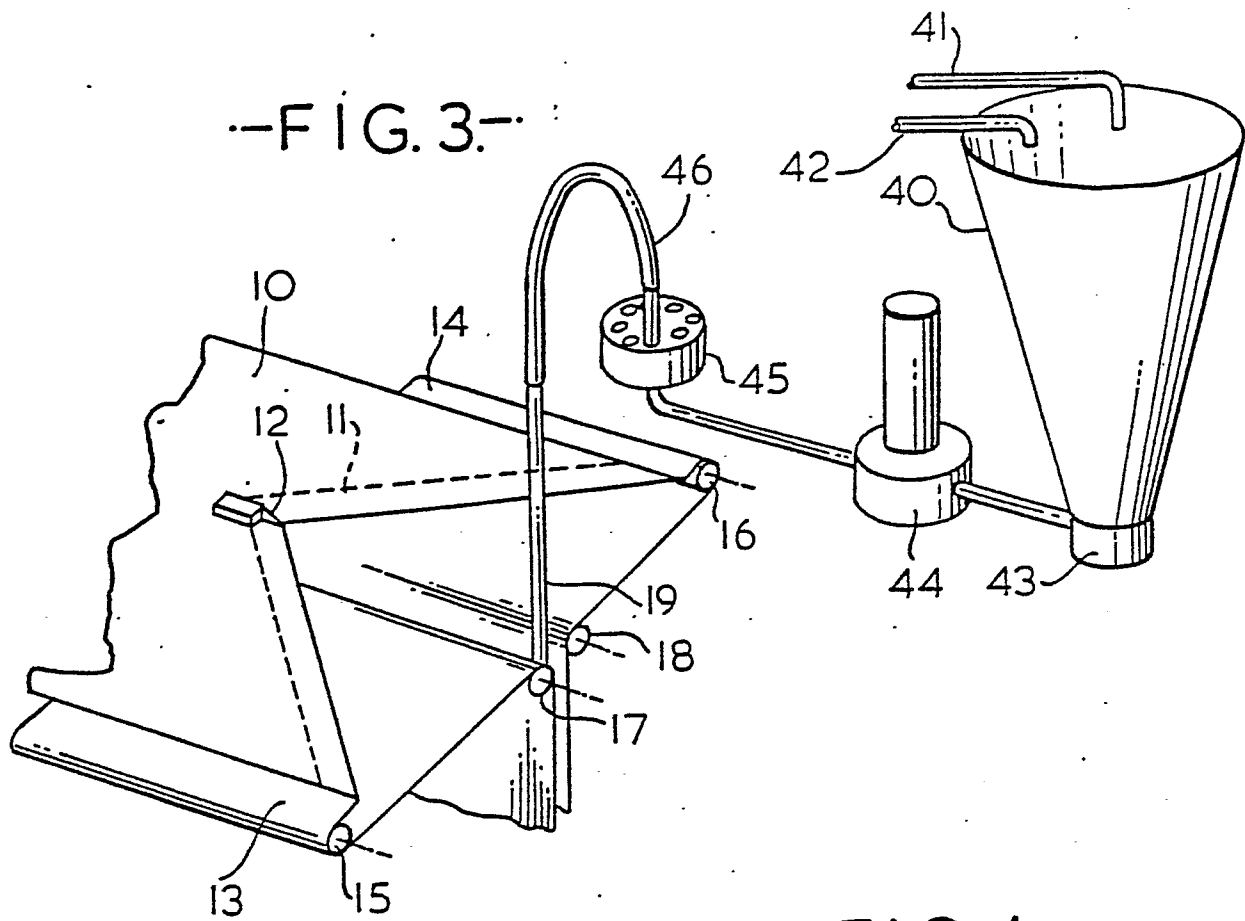
6. A method of manufacturing a water treatment product characterised in that it comprises the steps of forming a water soluble envelope, inserting a settable water treatment composition into the envelope, sealing the envelope, and allowing the product to set thereby providing a water treatment product having an air-tight water soluble skin so that the water treatment product may be handled without soiling the hands or releasing the odour of the product.

7. A method of manufacturing an air freshener characterised in that an air freshener gel is moulded into an envelope as the envelope is formed, the envelope being perforated and the perforations being covered by at least one removable label.

8. A product when manufactured by the method claimed in any one of the preceding claims.



-FIG. 3-



-FIG. 4-

