

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 731 448 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

13.12.2006 Bulletin 2006/50

(51) Int Cl.:

B65D 83/08 (2006.01)

(21) Application number: **06115105.6**

(22) Date of filing: **07.06.2006**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

Designated Extension States:

AL BA HR MK YU

(30) Priority: **11.06.2005 GB 0511894**

(71) Applicant: **3 S's Limited**

**WR8 0PW Worcestershire Upton-upon Severn
(GB)**

(72) Inventors:

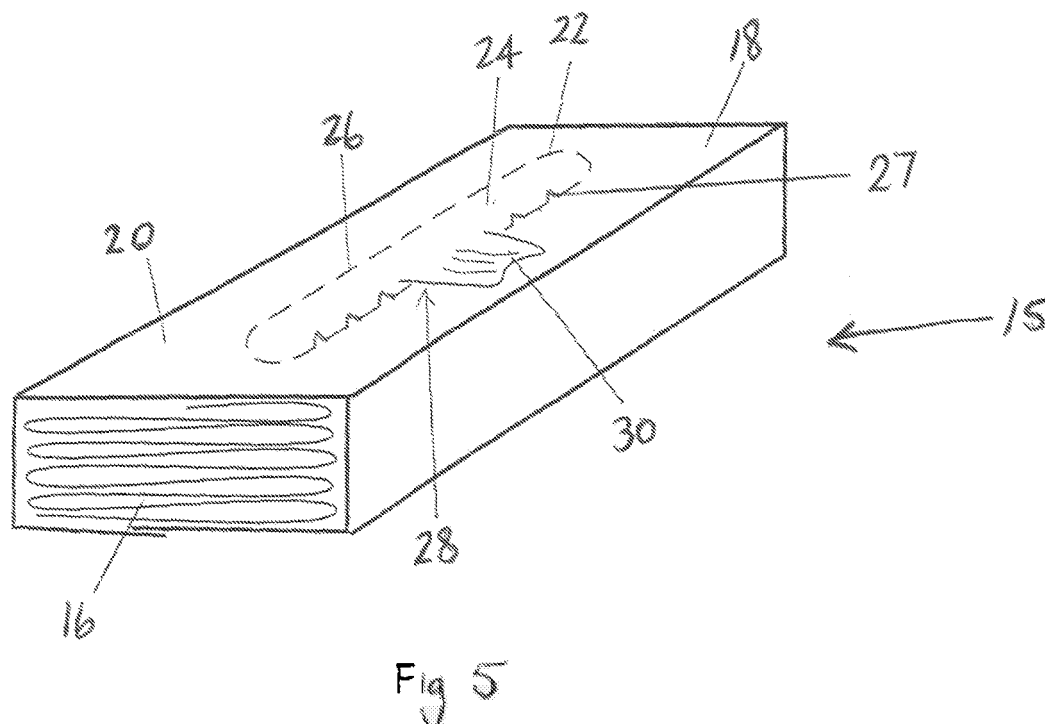
- **Smithson, Martin Dominic
Malvern, WR13 6LE (GB)**
- **Tan, Tien Tjiu
65153, Singosari (ID)**

(74) Representative: **Macpherson, Craig Stuart et al
Page Hargrave, Southgate, Whitefriars, Lewins
Mead
Bristol BS1 2NT (GB)**

(54) **Sheet material dispenser**

(57) The invention relates to a sheet material dispenser (15) comprising a container (18) and a stack of folded sheet material (10), the container (18) surrounding

the sheet material (10) and having an aperture (22) through which the sheet material (10) may be drawn in use of the dispenser (15), wherein the sheet material (10) is folded within the container (18) in a concertina manner.



EP 1 731 448 A2

Description

[0001] The present invention relates to a sheet material dispenser.

[0002] There are many different varieties of sheet material products available which are currently packaged in roll format for convenience. These range from masking film for automotive and aeronautic use to agricultural sheeting and domestic "cling" film. The common similarity between these products is that they are all made by extrusion process, either sheet or cast, and wound onto tubular cores. The cores can be made of paper tube, steel tube or they may be plastic, either tubular or a solid core. For most common applications the cores tend to have an inner diameter in the range from 25mm to 155mm and in industrial applications a typical core may have an inner diameter of approximately 75mm. The actual dimensions of each tube will depend on the type and length of the sheet material, hence the tube can have a wall thickness anywhere in the range from 3mm to about 20mm.

[0003] One thing that all these rolled sheeting have in common is that they take up a lot of space, due to the inherent and inevitable waste of space inside the tube. A schematic representation of a roll of sheet material 2 on a tube 4 is shown in Fig. 1. During storage or shipment the space 6 inside the tube 4 represents a considerable waste of space. This is a very important consideration when costing calculations are based on square footage or cubic footage. The volume of space inside the tube 4 can be anywhere between about 30% to about 70% of the total volume of the product. This becomes even more of a problem when the roll is packaged inside a box 8 for storage or transportation as shown in Fig. 2. When this occurs not only is space taken up by the tube 4 and the sheet material 2 but also the space 9 between the roll and the box 8 is wasted. When all of these factors are taken into account, the total space wasted in transporting a roll of sheet material can be as much as 85% of the volume of the packaged product.

[0004] It is the object of the present invention to alleviate some of the problems of the prior art, or at least to offer an alternative.

[0005] According to the present invention there is provided a sheet material dispenser comprising a container and a continuous length of folded sheet material, the sheet material being folded within the container in a concertina manner and the container surrounding the sheet material and having an aperture through which the sheet material may be drawn in use of the dispenser, characterised in that at least a portion of the periphery of the aperture is provided with means for cutting the sheet material once a desired length has been dispensed.

[0006] The term "concertina manner" should be easily understood and refers to the fact the sheet material has a plurality of transverse folds along its length. Each of the transverse folds is spaced apart by the same amount

and the sheet material is folded back on top of itself at each fold to form a neat stack.

[0007] The sheet material may be any material which is conventionally manufactured in sheets. As mentioned above, this may commonly be plastic materials such as masking film, agricultural sheeting or "cling" film. The plastic sheet material may have many different characteristics as summarised below:

a. The sheet material can be made from one single sheet or a combination of 2 or 3 or up to 4 sheets heat welded together;

b. The heat seal can be made from both hot air as well as direct heat rollers and any other method to join a film;

c. The thickness of the sheet material can be made from 7 μm up to 300 μm on the need. For automotive masking, the gauge can be in between 8-30 μm whereas agricultural can take 30 μm . Any other application such as for drop cloth, air cargo cover or container liner can be anywhere between 30 and 300 μm to suit the need;

d. The sheet material can be made from HMWHDPE, LLDPE, LDPE, PP, PA or a blend and/or multi layer structure;

e. The sheet material can be made with corona treatment on one side or both sides;

f. The sheeting material can be made with or without print from one colour one side up to 6 colour two sides;

g. The sheet material can be made with specific filler, in the case of automotive masking the sheet material may have stainless feature material giving stain free behaviour to the painted surface;

h. The sheet material can be given any additional feature such as holes or ventilation in the case of agricultural use;

i. The sheet material can be made in sheet or tubular form for different applications. When in tubular form the sheet material may conveniently be in the form of a plurality of individual bag portions with transverse perforations to delineate each bag;

j. The sheet material can be modified with features such as ultra violet resistance, flame retardance, conductivity, permanent anti static, water solubility, heat resistance at 160C for 30 minutes, 177C for 30 minutes, colorant, optical brightener or paperlike;

k. In the case of wide sections of sheet material the

sheet can be folded several times to form a finished folded size with widths from 300 μm up to 1000 mm; and

I. The heat seal, both with hot air, direct heat roller or sonic welding, gives useful lines that can function as positioning lines where the film/sheet can be located exactly on the intended area on first effort.

[0008] Essentially, any material which is currently manufactured as rolled sheets may be utilised according to the present invention.

[0009] The sheet material is located within the container and may be drawn through the dispensing aperture by a user as required. By removing the need for a tubular support the sheet material dispenser eliminates the associated wasted space and therefore results in significant cost savings. The sheet material is in the form of a rectangular, or less commonly a square stack, which can be easily stacked for storage and transportation. The sheet material may be removed from the container by grasping a free end of the sheet material, which is located adjacent the dispensing aperture, and pulling the sheet material in a direction away from the stack. Tests have shown that the removal of the sheet material from the container is comparable, or perhaps even slightly better, than conventional rolled dispensers.

[0010] A first end of the sheet material preferably extends out of the dispensing aperture. It is preferred that the first end of the sheet material is folded to provide a tab which may be grasped by a user. This simplifies the removal of the sheet material from the container and again offers an advantage over conventional rolled dispensers. In conventional rolled dispensers it is quite common for users to experience problems in grasping the free end of the sheet material and this can be frustrating to overcome. By folding the first end of the sheet material into a tab, which may conveniently be triangular in shape, only a small portion of the sheet material needs to protrude from the dispensing aperture. This improves the aesthetic appearance of the dispenser and also minimises the likelihood of damage to the sheet material.

[0011] The dispensing aperture is preferably in the form of a slot which extends across the width of the container. In order to ensure smooth dispensing of the sheet material from the container it is preferred that the dispensing aperture comprises up to 98% of the width of the container, more preferably up to 90% of the width of the container and most preferably up to 80% of the width of the container. It is important to obtain a balance between having a wide opening, through which the sheet material is easily dispensed, and maintaining the strength of the container. At aperture widths approaching 98% of the width of the container there is very little of the container material on either side of the aperture and these points could become weak points which may fail, resulting in the container breaking. Consequently, it is necessary to find a balance between a wide aperture and a

strong container and it has been shown that an aperture width of approximately 80% of the width of the container is optimum. However, it should be understood that the dispenser will still function satisfactorily with wider apertures than 80%, and the dispensing action may actually be improved.

[0012] The dispensing aperture is preferably wide enough to allow access to the sheet material, but not so wide as to allow the sheet material to fall out of the container. The width of the dispensing aperture is preferably in the range from 10mm to about 50mm, but it may vary according to the size of the sheet material, the container and other factors.

[0013] The dispensing aperture is preferably covered by a removable cover. It is preferred that a slot is provided, either in the cover, or, between the cover and the periphery of the aperture, through which the tab at the first end of the sheet material may extend. The cover protects the sheet material from dirt and debris. The cover also acts to protect the sheet material from damage, such as puncture, during storage and transportation. The cover may be removed by a user in order to access the sheet material for removal from the container. The cover may be made of the same material as the container, which is preferred, or it may be made of a different material. The cover may be attached to the container by any suitable means, such as adhesive.

[0014] It is preferred that the cover is made of the same material as the container. It is particularly preferred that the cover is integral to the container and is releasably attached to the container by a line, or lines, of weakening. In this way the dispensing aperture is created by the line of weakening which defines the periphery of the aperture. The line of weakness may conveniently be formed by a perforation line. The line of weakening preferably has a slot through which a tab of sheet material may extend. The action of removing the cover by breaking the line of weakness results in the creation of the dispensing aperture.

[0015] The periphery of the dispensing aperture may advantageously be capable of causing a break in the sheet material. This may be by virtue of the dispensing aperture being provided with cutting means or it may simply be due to the profile of the periphery of the aperture. The periphery of the aperture may advantageously be provided with a serrated cutting edge. In any event, such means enable the dispenser to provide a neat edge on the sheet material when it is dispensed. It avoids the need for the provision of a further tool, such as a knife, for trimming the sheet material prior to use. It also helps to avoid wastage of the sheet material by allowing the user to dispense the appropriate amount of sheet material as required.

[0016] The container preferably comprises a planar structure which is folded around the sheet material. This ensures that the construction of the dispenser is a simple operation. The method of forming the dispenser will be described in more detail below. However, it is clear that

the present invention reduces the amount of wasted space, as compared to conventional rolled sheet material dispensers. The container acts as packaging for the sheet material and also as a dispenser.

[0017] One embodiment of the container comprises a first panel, which has the dispensing aperture and, in use, forms the top surface of the dispenser. Extending from the long edges of the first panel are two side panels. Extending from each side panel is a portion of a base panel. The dispenser is formed by simply placing the stack of folded sheet material onto the first panel of the container, then folding the side and base panels around the sheet material and securing the base panels together by any suitable means, for example adhesive. The container is then enclosed in a plastic outer. This ensures that the container and preferably sheet material may be held together securely for storage and transportation. The plastic outer may conveniently be heat sealed to the container. This provides a neat package with no excess material, which is unsightly and more prone to snagging.

[0018] The length of each concertina fold is preferably in the range from 100 mm to 600 mm, more preferably in the range 200 mm to 400 mm. The container may be made of plastic material. This has the advantage of durability and it may also be re-used. Alternatively, the dispenser may be made of corrugated carton. This has the advantage of being cheap to manufacture and of being disposable. It is preferred that the thickness of the container is in the range from 75 μm to 350 μm .

[0019] According to a second aspect of the present invention, there is provided a method of packaging sheet material comprising the steps of:

- i. folding the sheet material in a concertina manner;
- ii. compressing the folded stack of sheet material;
- iii. placing the stack onto the top panel of a container, the container being in the form of a planar sheet having a top panel with a dispensing aperture, two side panels attached to the top panel and two base panels attached to the side panels; and
- iv. folding the side and base panels around the stack and securing the base panels together.

[0020] The method preferably further comprises the step of adjusting a first end of the sheet material such that it extends out of the dispensing aperture. The first end of the sheet material may conveniently be folded to form a tab which may be grasped by a user.

[0021] To provide a neat package, it is preferred that the method further comprises the step of enclosing the container and sheet material within a plastic outer. The plastic outer is then preferably heat sealed.

[0022] The invention will now be described, solely by way of example, with reference to the drawings, in which:

Fig. 1 shows a schematic representation of a prior art roll of sheet material;

Fig. 2 shows the sheet material of Fig. 1 in a box for storage or transportation;

Fig. 3 shows a schematic representation of a folded sheet of material;

Fig. 4 shows a perspective view of a folded sheet of material;

Fig. 5 shows a perspective view of a folded sheet of material in a container;

Fig. 6 shows a sectional view of the container of Fig. 5;

Fig. 7 shows a perspective view of the container of Fig. 5 inside a plastic outer;

Fig. 8 shows a sectional view of the product of Fig. 7.

Figs. 9A-9D show a schematic representation of the formation of a sheet material dispenser.

[0023] Referring now to Fig. 3, this shows a schematic representation of a length of sheet material 10, which has been folded in a concertina manner. In the prior art, as illustrated in Figs. 1 and 2, the sheet material 2 is wrapped around a tube 4. However, during storage or transportation the space 6 inside the tube constitutes a considerable waste of space.

[0024] By folding the sheet material 10 in a concertina manner there is no need for a tubular support and, consequently, the associated waste of space is avoided. Beginning with a free end 12 of the sheet material 10, the sheet material 10 is folded back and forth on top of itself at a plurality of transverse folds 14 along its length. The length of each individual section of folded material is dependent on the material and its intended use, but will typically be between 100 mm and 600 mm, which ensures ease of handling. As mentioned above, the sheet material 10 may be any material which is conventionally manufactured on sheet form, particularly plastic materials such as masking film, agricultural sheeting and "cling" film.

[0025] The sheet material 10 is folded along its length to form a neat stack 16. In order to minimise wasted space, the stack 16 is then compressed with a pneumatic or hydraulic arm to force air out from between the folded layers and to provide a neat stack 16 as shown in Fig. 4. The width of the sheet material 10 may vary according to its intended use. However, for ease of handling, the maximum working width of the sheet material 10 is between 200 mm and 1600 mm. In addition to folding the sheet material 10 in a concertina manner, the sheet material 10 may also be folded longitudinally in order to attain a working width within the permitted range. For example, the sides of the sheet material 10 may be folded inwards by an equal amount to achieve this.

[0026] Referring now to Figs. 5 and 6, these show a

dispenser 15 comprising the stack 16 of sheet material 10 of Fig. 4 disposed in a container 18. The container 18 is made of corrugated carton with a thickness of approximately 200 μm . Alternatively, the container 18 could be made of a suitable plastics material. This would have the advantage of being re-usable but would be more expensive than the carton container. The process of forming the container 18 around the stack will be described in more detail with reference to Figs. 9A-9D. In Figs. 5 and 6 the container 18 is open sided but it may also be in the form of a box having closed sides. The advantage of the container 18 shown in Figs. 5 and 6 is that it utilises less material and is cheap and quick to form.

[0027] A top surface 20 of the container 18 is provided with a dispensing aperture 22. In use of the dispenser 15 the sheet material 10 is drawn through the dispensing aperture 22 by a user in order to dispense a specific quantity of sheet material 10. The dispensing aperture 22 is approximately 80% of the width of the container 18. This ensures that the sheet material 10 may be efficiently dispensed without too much interference from the container 18. However, by limiting the width of the dispensing aperture 22 to 80% of the width of the container 18 it ensures that the strength of the container 18 is maintained.

[0028] The dispensing aperture 22 is provided with a removable cover 24. The cover 24 protects the sheet material 10 from dirt and debris and also acts to prevent damage, for example from puncture. The cover 24 is integral to the container 18 and the dispensing aperture 22 is defined by a line of weakness 26, in the form of a line of perforations. The cover 24 may be removed by breaking the line of weakness 26 e.g. by tearing the cover 24 away from the container 18. As can be seen in Fig. 5, a slot 28 is provided in the line of weakness 26 through which a tab 30 of the sheet material 10 extends.

[0029] A first end 30 of the sheet material 10 extends out of the slot 28 provided in the line of weakness 26. The first end 30 of the sheet material 10 is folded to form a tab 30 which may be easily grasped by a user. The action of grasping and pulling the tab 30 will first cause the line of weakness 26 to partially break, thus enabling the sheet material 10 to be drawn through the dispensing aperture 22. The cover 24 may then be completely removed from the container 18, or it may be left in place and can be folded down to provide protection once a quantity of sheet material 10 has been removed.

[0030] In an alternative embodiment, the cover 24 may not be completely removable from the container 18 but may be partially removable, in order to permit efficient dispensing, but may be reattached to the container 18 following dispensing. This ensures that the protection offered by the cover 24 may be retained between each dispensing operation.

[0031] A portion of the periphery of the dispensing aperture 22 is provided with a cutter 27 for cutting the sheet material 10. The cutter 27 is in the form of a serrated edge. Once an appropriate amount of sheet material 10 has been dispensed from the dispenser 15 the sheet ma-

terial 10 is brought into contact with the serrated edge, thus causing a breakage in the sheet material 10. This is effected by altering the angle at which the sheet material 10 is pulled away from the dispenser 15. In dispensing mode the sheet material 10 is pulled away from the container in a direction perpendicular to the top surface 20 of the container 18. In order to break the sheet material 10 it is pulled in a direction parallel to the top surface 20, thus bringing it into contact with the cutter 27.

[0032] In order to prepare the dispenser 15 for transportation and storage, the container 18 containing the sheet material 10 is packaged within a polythene pouch 32, as shown in Figs. 7 and 8. The polythene pouch 32 is heat sealed such that it conforms to the profile of the container 18. This provides a neat, protective cover which ensures that the container 18 and the sheet material 10 are not damaged during transportation and storage.

[0033] Referring now to Figs. 9A-9D, these schematically represent the process of packaging a stack 16 of sheet material 10 in a corrugated carton container 18. Firstly, the sheet material 10 is folded into a stack 16 in a concertina manner, as described in relating to Fig. 3. The stack 16 is then compressed to force out any air from between the layers. Next, the stack 16 is placed onto the top surface 20 of the container 18. The container 18 is formed from a single planar sheet of corrugated cardboard. The planar sheet has score lines 34a-d which define a top surface 20, two side panels 36a, 36b and two sections 38a, 38b of a base panel. The top surface 20 is provided with the dispensing aperture 22 and is the surface onto which the stack 16 is placed in formation of the dispenser 15, as shown in Fig. 9A.

[0034] The side panels 36a, 36b and attached sections 38a, 38b of the base panel are then folded around the stack 16, as shown in Fig. 9B. The two sections 38a, 38b of the base panel overlap and are secured together using adhesive 40.

[0035] Next, as shown in Fig. 9C, the free end 30 of the stack 16, which is located adjacent to the dispensing aperture 22, is pulled through the dispensing aperture 22 to provide a tab 30 which may be grasped by a user in use of the dispenser 15. To complete the dispenser and prepare it for storage and transportation, the container 18 is sealed within a polythene pouch 32, using conventional vacuum packing apparatus. It is particularly preferred that the container 18 is sealed within the pouch 32 using the apparatus disclosed in WO 02/083505.

[0036] The invention has been described with reference to one particular embodiment. However, it will be clear that other embodiments of the invention, falling within the scope of the claims, are possible.

Claims

1. A sheet material dispenser comprising a container and a continuous length of folded sheet material, the sheet material being folded within the container in a

- concertina manner and the container surrounding the sheet material and having an aperture through which the sheet material may be drawn in use of the dispenser, **characterised in that** at least a portion of the periphery of the aperture is provided with means for cutting the sheet material once a desired length has been dispensed.
2. A sheet material dispenser according to claim 1, wherein the means for cutting the sheet material comprises a cutting edge.
 3. A sheet material dispenser according to claim 2, wherein the cutting edge is serrated.
 4. A dispenser according to any preceding claim, wherein a first end of the sheet material extends out of the dispensing aperture.
 5. A dispenser according to claim 4, wherein the first end of the sheet material is folded to provide a tab which may be grasped by a user.
 6. A dispenser according to any preceding claim, wherein the dispensing aperture comprises up to 98% of the width of the container.
 7. A dispenser according to claim 6, wherein the dispensing aperture comprises up to 90% of the width of the container.
 8. A dispenser according to claim 7, wherein the dispensing aperture comprises up to 80% of the width of the container.
 9. A dispenser according to any preceding claim, wherein the dispensing aperture is covered by a removable cover.
 10. A dispenser according to claim 9, wherein the cover is releasably attached to the container by lines of weakening.
 11. A dispenser according to any preceding claim, wherein the container comprises a planar structure which is folded around the sheet material.
 12. A dispenser according to any preceding claim, wherein the container is enclosed in a plastic outer.
 13. A dispenser according to claim 12, wherein the plastic outer is heat sealed to the container.
 14. A dispenser according to any preceding claim, wherein the length of each concertina fold is in the range from 100mm to 600mm.
 15. A dispenser according to any preceding claim, wherein the container is made of plastic material.
 16. A dispenser according to any one of claims 1-14, wherein the dispenser is made of corrugated carton.
 17. A dispenser according to any preceding claim, wherein the thickness of the container is in the range from 75 μ m to 350 μ m.
 18. A method of packaging a continuous length of sheet material comprising the steps of:
 - i. folding the sheet material in a concertina manner;
 - ii. compressing the folded stack of sheet material;
 - iii. placing the stack onto the top panel of a container, the container being in the form of a planar sheet having a top panel with a dispensing aperture, two side panels attached to the top panel and two base panels attached to the side panels; and
 - iv. folding the side and base panels around the stack and securing the base panels together.
 19. A method according to claim 18, comprising the steps of:
 - adjusting the first end of the sheet material such that it extends out of the dispensing aperture.
 20. A method according to claim 19, wherein the first end of the sheet material is folded to form a tab which may be grasped by a user.
 21. A method according to any one of claims 18-20, further comprising the step of:
 - enclosing the container and sheet material within a plastic outer.
 22. A method according to claim 21, further comprising the step of heat sealing the plastic outer.

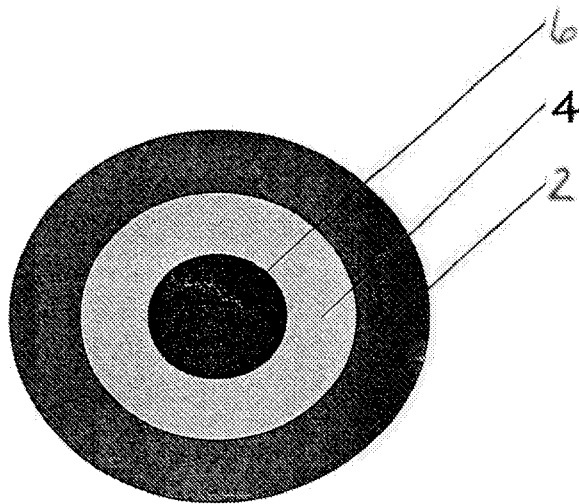


Fig. 1

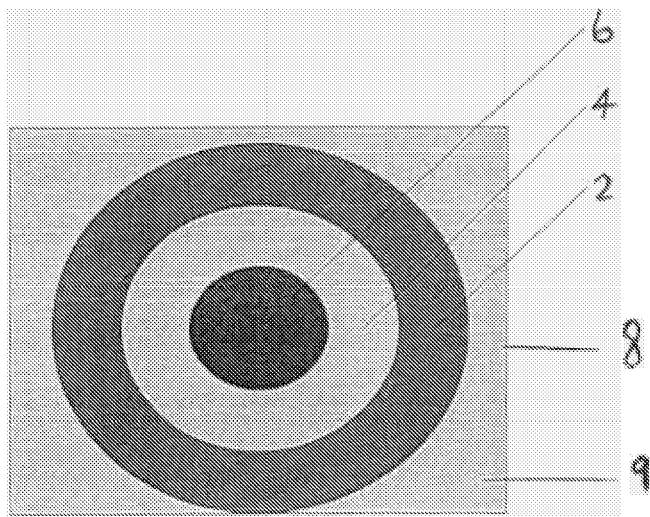


Fig. 2

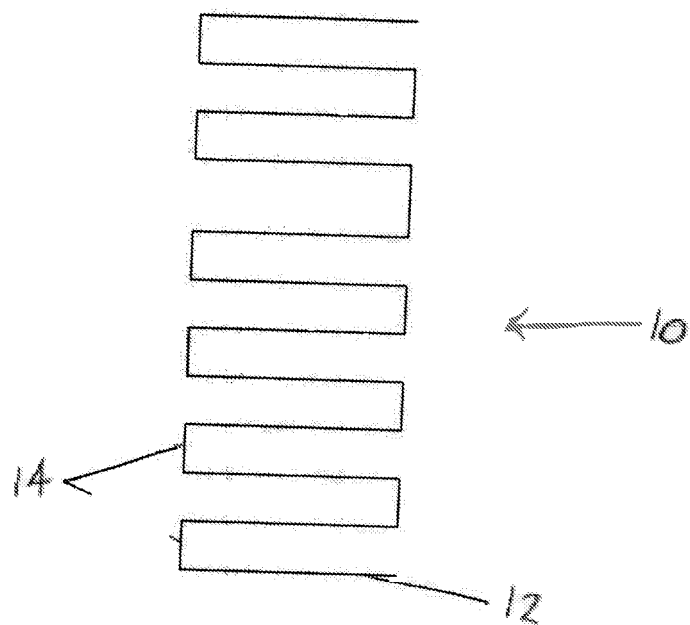


Fig. 3

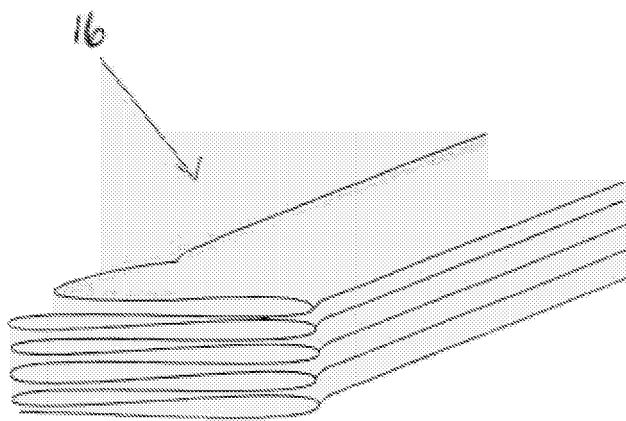


Fig. 4

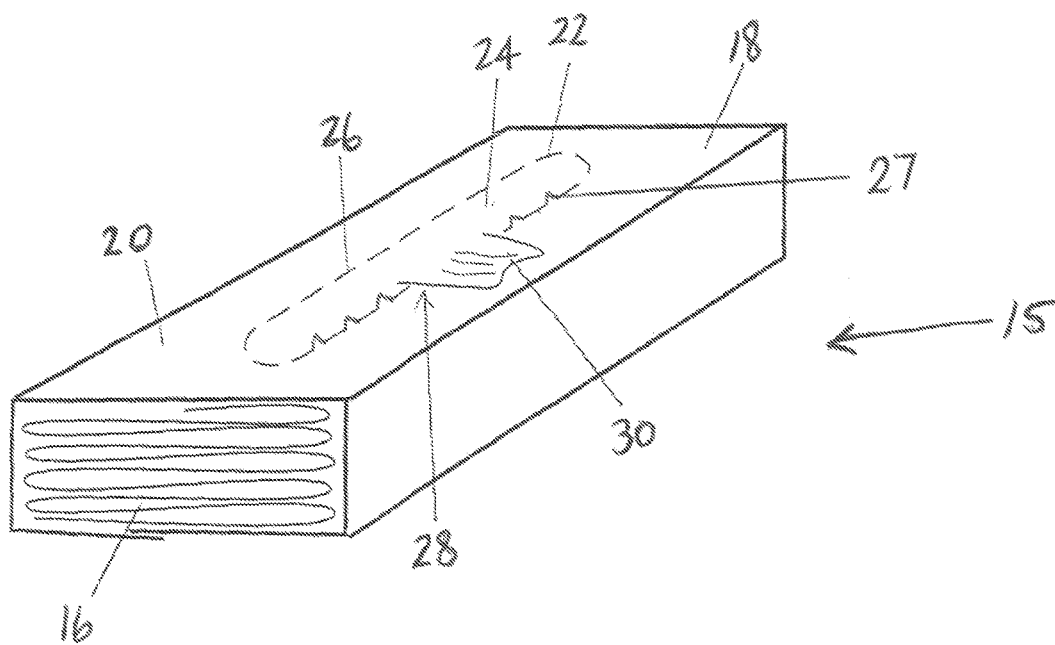


Fig 5

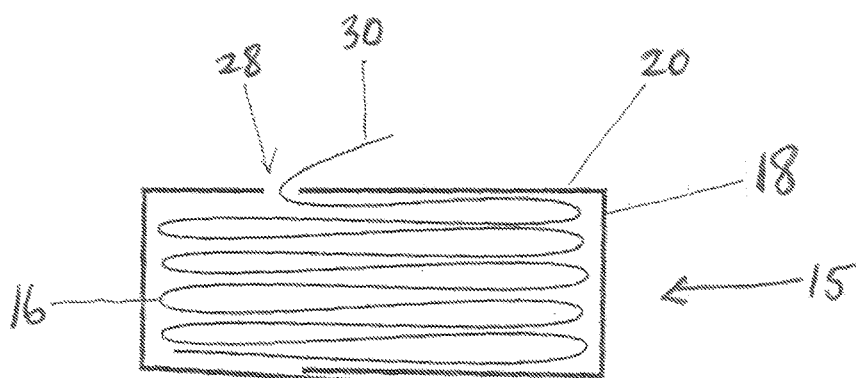


Fig 6

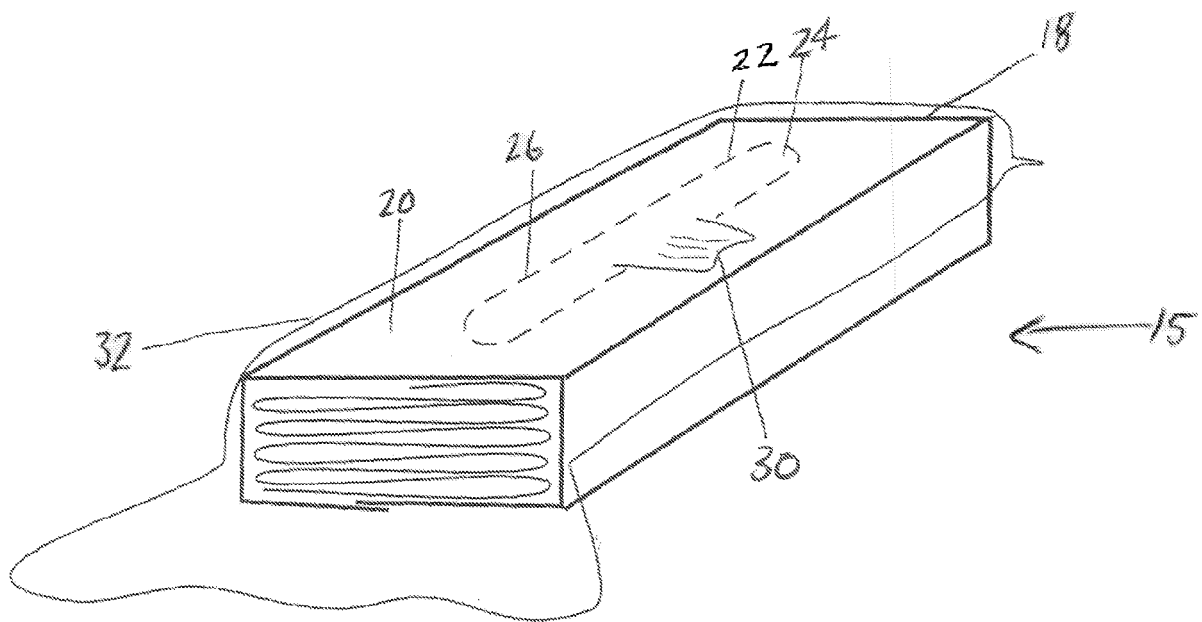


Fig 7

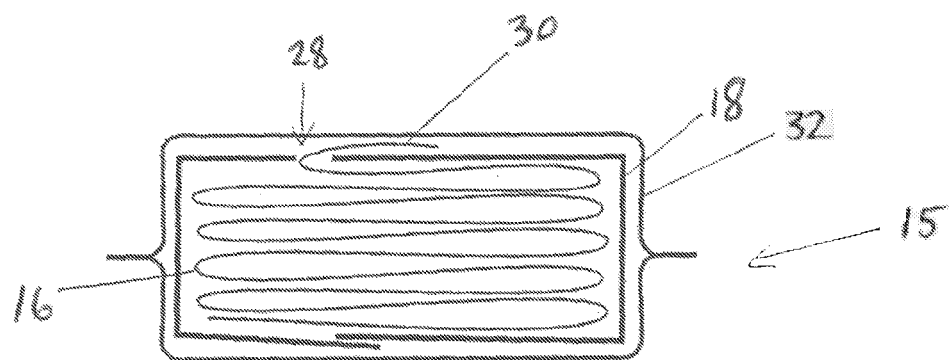


Fig 8

Fig

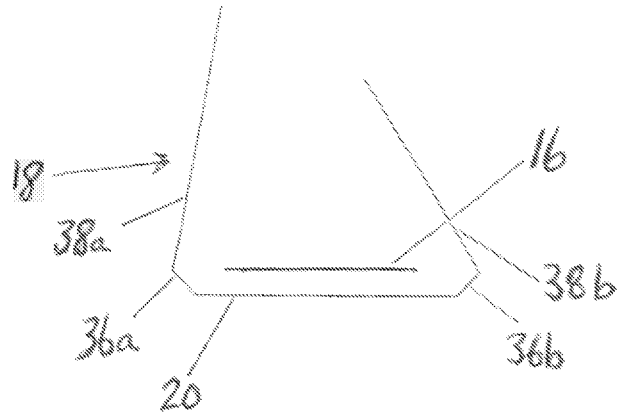


Fig. 9B

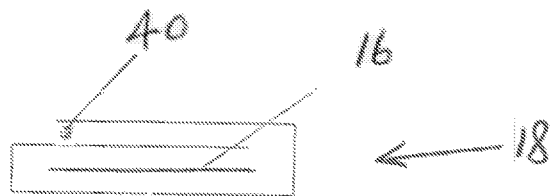


Fig. 9C

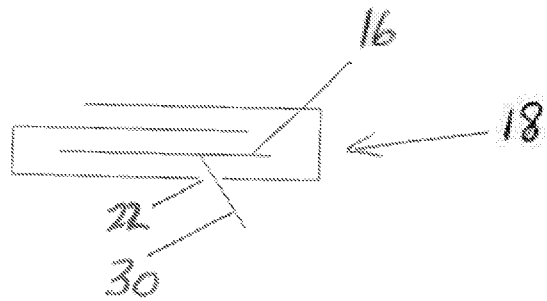
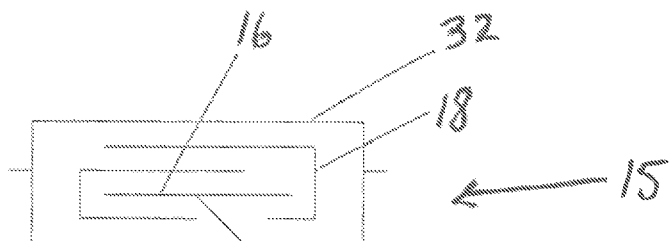


Fig 9D



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 02083505 A [0035]