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(73) Proprietor: **CHIYODA SHIGYO CO., LTD.**
7-8 Shibuya 1-chome
Shibuya-ku Tokyo (JP)

(73) Proprietor: **Ishikawa, Katsuo**
6-6 Tamase-cho Ibaragi City
Oskaka-fu (JP)

(72) Inventor: **Ishikawa, Katsuo**
6-6, Tamase-Cho
Ibaragi City Osaka-Fu (JP)

(74) Representative: **Needle, Jacqueline et al**
PAGE, WHITE & FARRER 5 Plough Place New
Fetter Lane
London EC4A 1HY (GB)

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Description

This invention relates to a heavy duty bag for powder or granular material comprising a plurality of sheets, said sheets being shifted to each other for providing stepwise margins for pasting, and being folded and pasted to form a cylindrical body having an inside valve, said upper and lower margins of said cylindrical body being folded and pasted to form the bag, and a closing strip attached to an upper portion of the bag.

Such a heavy duty bag has been described in French Patent specification No. 2028049. Similar bags are described in French Patent specification Nos. 2464892 and 1089416 which also have inside valves and closing strips. However the bags according to all these specifications are difficult to manufacture.

A heavy duty bag has also been proposed in Japanese Utility Model Application Publication No. 1,831/66 published on February 9, 1966. However, the bag disclosed in this publication has the disadvantage that it allows powder or granular material filled in the bag to leak through its inside valve during its transportation or storage although the opening is designed to prevent the leakage of the material.

It is an object of the present invention to provide an improved heavy duty bag which reduces the disadvantages of the prior art and, in particular, which is easy to manufacture and can easily be closed after filling.

The present invention provided a heavy duty bag as defined above, characterised in that the bag is formed of a first inner sheet and a second outer sheet, and in that the inside valve is formed by folding an upper portion of one of the folded portions along substantially triangular lines and in that the closing strip is attached to cover over at least part of said upper portion of the bag and to cover completely the inside valve by a part of the strip whose surface in opposition to the inside valve is applied with a hot melt adhesive.

In a preferred embodiment of the invention there is provided an improved heavy duty bag of the first mentioned kind for powder or granular material which in addition to the closing strip, comprises a flexible film preferably a synthetic resin film in the proximity of the inside valve, thereby completely preventing the material filled therein from leaking through the opening during its transportation or storage.

In a second preferred embodiment of the invention, the bag further comprises a flexible film interposed between the inner and outer sheets in the proximity of the inside valve and extending somewhat into the bag.

In order that the invention may be more clearly understood, preferred embodiments will be described, by way of example, with reference to the accompanying drawings.

Fig. 1 is a development view of a typical blank consisting of an inner and an outer sheet for manufacturing a bag according to the invention.

Fig. 2 is a front elevation of a cylindrical body

formed by the blank as shown in Fig. 1 as in one step of manufacturing the bag.

Fig. 3 is a sectional view taken along a line III-III in Fig. 2 illustrating an adhesive by small circles on an exaggerated scale;

Fig. 4 is a front elevation of the bag obtained by folding and pasting an upper and a lower portion of the cylindrical body shown in Fig. 2;

Fig. 5 is a plan view of a closing strip to be attached to the bag according to the invention;

Fig. 6 is a front elevation of the bag comprising the closing strip shown in Fig. 5 according to the invention;

Fig. 7 is a perspective view of the bag according to the invention after filled with a powder material but prior to closing an inside valve with the aid of hot-melt adhesive applied to the closing strip;

Fig. 8 is a partial front elevation showing a preferred embodiment of the bag according to the invention comprising a flexible film interposed between an inner and an outer sheet of the bag;

Fig. 9 is a plan view of an upper portion of the bag shown in Fig. 8 opening the upper portion of the bag to disclose the part of the flexible film extending into the bag;

Fig. 10 is a development view of a blank for constituting the bag according to the invention advantageous in avoiding waste sheets of paper;

Fig. 11 is a plan view of a patch piece for reinforcing a single sheet portion of the bag shown in Fig. 10; and

Fig. 12 is a partial front elevation of a cylindrical body formed by the blank shown in Fig. 10 for explaining the single sheet portion of the bag.

Fig. 1 illustrates an exemplary blank for constituting a bag according to the invention, which consists of an inner sheet 2 and an outer sheet 4 arranged shifted or offset with each other for providing spaces or margins for pasting. In this embodiment, the blank is of kraft paper. However, any kinds of material may be used for this purpose, so long as they are suitable for heavy duty bags. The inner sheet 2 includes an upper projection 6, a bottom portion 8 and upper shoulders 10 and 12 and bottom shoulders 14 and 16 continual to both ends of the inner sheet 2. The outer sheet 4 also includes an upper projection 18, a bottom portion 20 and upper shoulders 22, 24, 26 and 28 and bottom shoulders 30, 32, 34 and 36. Chain lines 38-54 illustrate folding lines among which one-dotted lines 40, 46 and parts of 50 and 52 are outwardly folded lines and two-dotted lines 38, 42, 44, 48 and 54 and parts of 50 and 52 are inwardly folded lines. It will clearly be seen from Figs. 1 and 7 that folding along lines 38, 40, 42, 44, 46 and 48 in the manner described above enables the bag to be formed with gusseted sides. As above described, the inner and outer sheets 2 and 4 are shifted relative to each other as shown in Fig. 1.

An adhesive is applied to right and left ends of the inner and outer sheets 2 and 4 as viewed in Fig. 1. The sheets are then folded along the folding lines shown in Fig. 1 to form an open ended envelope as shown in Fig. 2. At the same

time, the sheets are folded along the lines 50, 52 and 54 into a substantial triangular shape to form an inside valve whose particular function will be explained later. The edges of the inner and outer sheets 2 and 4 at upper and lower portions 56 and 58 are shifted in a stepwise manner as shown in Fig. 2.

As shown in Fig. 3 which is a schematic sectional view taken along the line III-III in Fig. 2, the adhesive (shown by small circles on an exaggerated scale) is applied to the step portions of the upper and lower portions 56 and 58, which are then folded along lines 60 and 62 to form a bag having a blowing-in opening or inlet 64 which is referred to as "inside valve" for filling powder or granular material into the bag by blowing as shown in Fig. 4. Inwardly extending edges 65 formed by folding the parts of the sheets along the lines 50, 52 and 54 as above described form a check valve for preventing the material from leaking or escaping through the inside valve 64.

According to the invention, there is provided a rectangular closing strip 66 to be applied to the upper portion 56 as shown in Figs 5 and 6. The closing strip 66 is coated with a hot-melt adhesive schematically shown by small dots on an area 68 of its one surface, which is sufficient to cover the opening 64 of the bag. A conventional adhesive such as starchy paste is applied to the remaining area 70 of the closing strip 66. The closing strip 66 is inwardly folded along a two-dotted chain line 72 and attached in the form of overriding to the flat upper portion 56 prior to filling the material with the area 70 of the closing strip 66, the area 68 being free from attaching to the bag, to complete the heavy duty bag according to the invention.

The hot-melt adhesive may be one of thermoplastic resin such as polyolefin resin or polyvinyl acetate. The hot-melt adhesive may be applied all over the surface of the closing strip 66 without using the starchy paste, although it is somewhat expensive. In this embodiment, the closing strip 66 has adjacent sides substantially corresponding to a width and a thickness of the bag completely filled with the material. However, the adjacent sides of the closing strip may be shorter than the width and thickness of the bag.

The closing strip 66 may be an ornament paper or having patterns illustrating a trademark or quality or weight of the material enclosed therein. The closing strip 66 may be of kraft paper or any other sheets different from that of the bag.

When the bag is filled with the powder or granular material, it becomes substantially a neat square or rectangular box-shaped bag. The free end of the closing strip is positioned above the inside valve 64. The end area 68 of the closing strip 66 is urged onto the inside valve 64 while heating at 150-200°C to cause the area 68 of the closing strip 66 to adhere to the top of the bag completely concealing it. Even if, the strip is shorter than the width of the bag, at least the inside valve 64 is completely covered by the latest adhered area 68 of the closing strip 64.

The bag according to the embodiment can

therefore prevent the material filled therein from leaking or escaping therefrom during transportation and storage with the aid of the closing strip covering the inside valve in conjunction with the function of the check valve owing to the particular configuration of the inside valve itself.

Fig. 8 illustrated a second embodiment of the invention, wherein like components have been designated by the same reference numerals as those in the preceding embodiment. A bag partially illustrated in Fig. 8 is similar to the bag shown in Fig. 2 with exception that a flexible film 74 is interposed between an inner and an outer sheet 2 and 4 at folded portion along lines 38, 40 and 42 in the proximity of the lines 50, 52 and 54. As shown in Fig. 9, an upper end 76 of the flexible film 74 somewhat extends in the bag to the right as viewed in this drawing. It is preferable to apply an adhesive in a spot-like manner to the film or any one of sheets to prevent the film from shifting from its initial location therebetween. The flexible film is preferably a synthetic resin film such as polyvinyl chloride but does not preclude any other flexible materials.

It is of course understood that the bag of the embodiment shown in Fig. 8 is provided with a closing strip 66 identical with that shown in Fig. 5.

With this arrangement, when the closing strip is urged against an inside valve 64 of the bag while heating, the extending end of the flexible film is in close contact with an upper inside of the inside valve 64 and a lower portion of the inside valve 64 is then brought in close contact with the upper inside of the opening, thereby effectively and completely preventing the material from leaking through the opening in conjunction with the function of the closing strip.

Fig. 10 illustrates a preferable blank for a bag according to the invention, consisting of an inner and an outer sheet 82 and 84. In this drawing, phantom lines 82', 84', 82" and 84" illustrate adjacent blank for the bags to be cut from the long blank sheets of paper. As can be seen from the drawing, cutting of respective blanks from the long blank sheets of paper does not cause any waste sheets of paper, which is advantageous in economical viewpoint. However, such economical cutting causes a missing portion 90 in the outer sheet so that the complete bag includes a single paper portion consisting of the inner sheet. A patch piece or reinforcing piece 86 (Fig. 11) of the same paper of the blank is attached to that missing portion of the outer sheet 84 to reinforce the strength of the single paper portion of the bag, thereby avoiding any breaking down of the bag during its transportation or storage.

As can be seen from the above description, the bag according to the invention can prevent powder or granular material filled therein from leaking or flowing out through an inside valve of the bag during its transportation or storage by the closing strip covering the inside valve. Furthermore, the bag of the preferred embodiment of the invention comprises a flexible film preferably sythetic resin film interposed between the inner and outer

papers at folded portions in the proximity of the inside valve, thereby securing the prevention of the material filled therein from leaking or flowing out through the inside valve of the bag in conjunction with the function of the closing strip during the transportation or storage of the bag. The bag according to the invention is very useful in practical use for the above advantages.

Claims

1. A heavy duty bag for powder or granular material, comprising a plurality of sheets (2, 4), said sheets being shifted to each other for providing stepwise margins for pasting, and being folded and pasted to form a cylindrical body having an inside valve (64), said upper and lower margins of said cylindrical body being folded and pasted to form the bag, and a closing strip (66) attached to an upper portion of the bag, characterised in that the bag is formed of a first inner sheet (2) and a second outer sheet (4), and in that the inside valve is formed by folding an upper portion of one of the folded portions along substantially triangular lines (50, 52, 54) and in that the closing strip (66) is attached to cover over at least part of said upper portion of the bag and to cover completely the inside valve by a part of the strip whose surface in opposition to the inside valve is applied with a hot-melt adhesive.

2. A heavy duty bag as claimed in Claim 1, further characterised in that the sheets (2, 4) are folded along fold lines (38, 40, 42, 44, 46, 48) such that the bag is formed with gusseted sides.

3. A heavy duty bag as claimed in Claim 1 or 2, wherein said bag further comprises a flexible film interposed between said inner and outer sheets (2, 4) in the proximity of said inside valve (64) and extending somewhat into the bag.

4. A heavy duty bag as claimed in Claim 3, wherein said flexible film (74) is attached to at least one of said sheets (2, 4) by a spot-like applied adhesive.

5. A heavy duty bag as claimed in Claim 3 or 4, wherein said flexible film (74) is a synthetic resin film such as polyvinyl chloride.

6. A heavy duty bag as claimed in any preceding claim, wherein said closing strip (66) is rectangular having adjacent sides substantially corresponding to a width and a thickness of said bag when completely filled with the material so as to substantially cover the upper surface of the completely filled bag.

7. A heavy duty bag as claimed in any of Claims 1 to 5, wherein said closing strip (66) is rectangular which is longitudinally folded and attached to the upper portion of the bag so as to extend over both surfaces of the bag in a flat condition before filling the material.

Patentansprüche

1. Sack für starke Beanspruchung zur Aufnahme von Pulver oder körnigem Material, der mehrere Folien (2, 4) aufweist, wobei die Folien zur

Bildung von stufenweisen Klebrändern gegenseitig versetzt und so gefaltet und verklebt sind, daß sie einen zylindrischen Körper mit einem inneren Ventil (64) bilden, wobei der obere und untere Rand des zylindrischen Körpers so gefaltet und verklebt sind, daß der Sack gebildet wird, und wobei ein Verschlußstreifen (66) am oberen Teil des Sackes befestigt ist, dadurch gekennzeichnet, daß der Sack aus einer ersten inneren Folie (2) und einer zweiten äußeren Folie (4) gebildet ist und daß das innere Ventil gebildet ist, in dem ein oberer Teil eines der gefalteten Teile längs im wesentlichen dreieckiger Linien (50, 52, 54) gefaltet ist, und daß der Verschlußstreifen (66) so angebracht ist, daß er wenigstens einen Abschnitt des oberen Teils des Sackes überdeckt und das innere Ventil durch einen Abschnitt des Streifens vollständig abdeckt, dessen dem inneren Ventil gegenüberliegende Fläche mit einem Heißschmelzkleber versehen ist.

2. Sack für starke Beanspruchung nach Anspruch 1, dadurch gekennzeichnet, daß die Folien (2, 4) längs der Faltlinien (38, 40, 42, 44, 46, 48) derart gefaltet sind, daß der Sack mit Seitenfalten versehen ist.

3. Sack für starke Beanspruchung nach Anspruch 1 oder 2, der ferner eine flexible dünne Folie aufweist, die zwischen der inneren und der äußeren Folie (2, 4) in der Umgebung des inneren Ventils (64) angeordnet ist und sich etwas in den Sack hinein erstreckt.

4. Sack für starke Beanspruchung nach Anspruch 3, wobei die flexible dünne Folie (74) an wenigstens einer der Folien (2, 4) durch einen punktförmig aufgetragenen Klebstoff befestigt ist.

5. Sack für starke Beanspruchung nach Anspruch 3 oder 4, wobei die flexible dünne Folie (74) eine Kunstharzfolie, wie Polyvinylchlorid, ist.

6. Sack für starke Beanspruchung nach einem der vorangehenden Ansprüche, wobei der Verschlußstreifen (66) rechtwinklig ausgebildet ist und aneinandergrenzende Seiten aufweist, die im wesentlichen einer Breite und einer Dicke des Sackes entsprechen, wenn dieser vollständig mit dem Material gefüllt ist, so daß er die obere Fläche des vollständig gefüllten Sackes vollständig abdeckt.

7. Sack für starke Beanspruchung nach einem der Ansprüche 1 bis 5, wobei der Verschlußstreifen (66) rechtwinklig ausgebildet, längs gefaltet und an dem oberen Teil des Sackes derart befestigt ist, daß er sich über beide Oberflächen des vor dem Einfüllen des Materials in flachem Zustand befindlichen Sackes erstreckt.

Revendications

1. Sac pour lourdes charges destiné à une poudre ou une matière granulaire, comprenant plusieurs feuilles (2, 4), lesdites feuilles étant décalées les unes des autres pour former des marges échelonnées à coller, et étant pliées et collées pour former un corps cylindrique ayant une valve intérieure (64), lesdites marges supérieures et inférieures dudit corps cylindrique étant

pliées et collées pour former le sac, et une bande (66) de fermeture étant attachée à une partie supérieure du sac, caractérisé en ce que le sac est form d'une première feuille intérieure (2) et d'une seconde feuille extérieure (4), et en ce que la valve intérieure est formée par pliage d'une partie supérieure de l'une des parties pliées suivant des lignes sensiblement triangulaires (50, 52, 54) et en ce que la bande (66) de fermeture est attachée de façon à recouvrir au moins une portion de ladite partie supérieure du sac et à recouvrir complètement la valve intérieure par une portion de la bande dont la surface, opposée à la valve intérieure, est revêtue d'un adhésif thermofusible.

2. Sac pour lourdes charges selon la revendication 1, caractérisé en outre en ce que les feuilles (2, 4) sont pliées suivant des lignes de pliage (38, 40, 42, 44, 46, 48) telles que le sac formé présente des côtés à goussets.

3. Sac pour lourdes charges selon la revendication 1 ou 2, dans lequel ledit sac comprend en outre un film flexible interposé entre lesdites feuilles intérieure et extérieure (2, 4) à proximité de ladite valve intérieure (64) et pénétrant quelque peu dans le sac.

4. Sac pour lourdes charges selon la revendication 3, dans lequel ledit film flexible (74) est attaché à au moins l'une desdites feuilles (2, 4) par un adhésif appliqué par points.

5. Sac pour lourdes charges selon la revendication 3 ou 4, dans lequel ledit film flexible (74) est un film résine synthétique tel que du polychlorure de vinyle.

6. Sac pour lourdes charges selon l'une quelconque des revendications précédentes, dans lequel ladite bande (66) de fermeture est rectangulaire, comportant des côtés adjacents qui correspondent sensiblement à une largeur et à une épaisseur dudit sac lorsqu'il est complètement rempli de matière, de façon à recouvrir sensiblement la surface supérieure du sac complètement rempli.

7. Sac pour lourdes charges selon l'une quelconque des revendications 1 à 5, dans lequel ladite bande (66) de fermeture est rectangulaire, et est pliée longitudinalement et attachée à la partie supérieure du sac afin de s'étendre sur les deux surfaces du sac dans l'état aplati avant le remplissage de la matière.

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FIG. 1

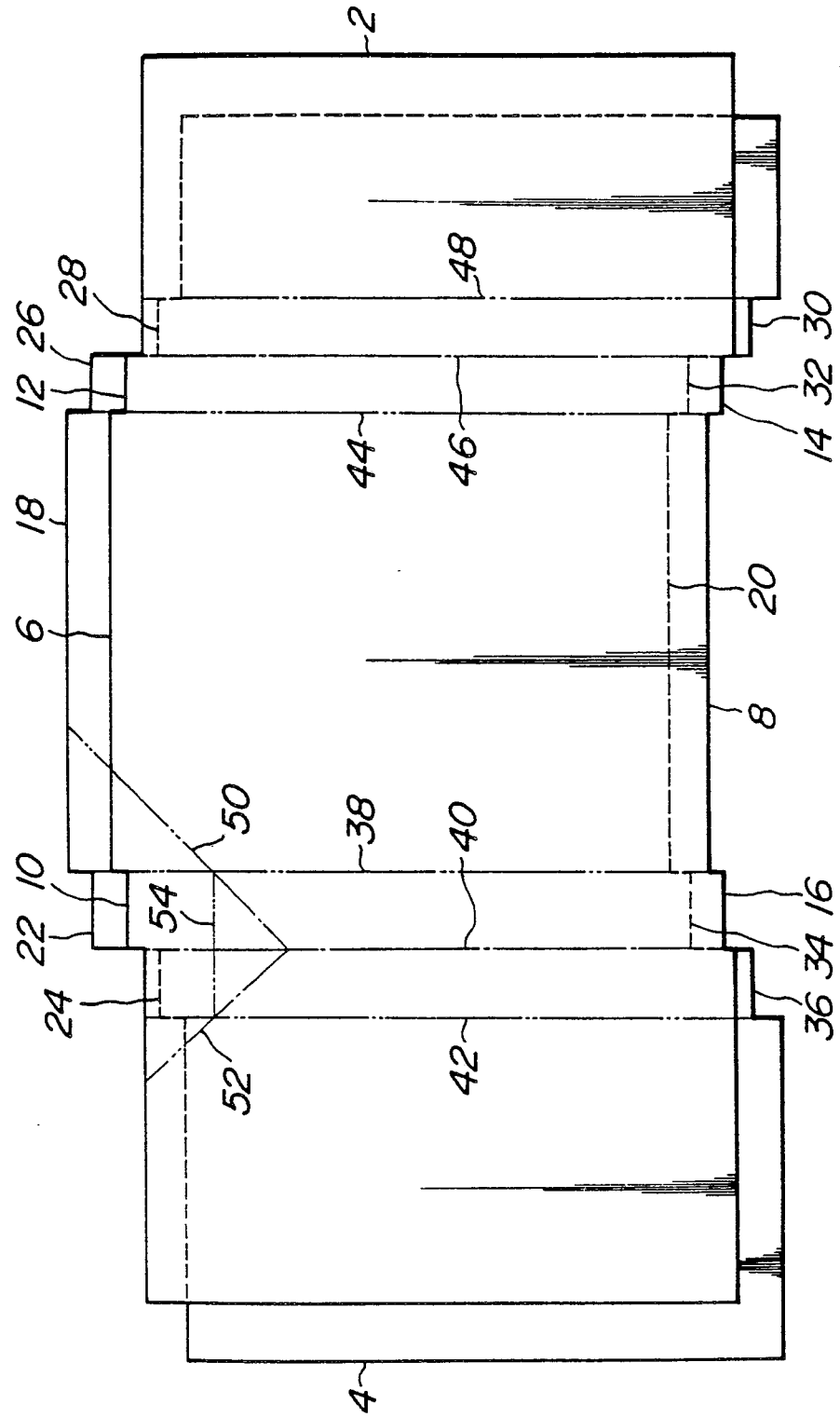


FIG. 2

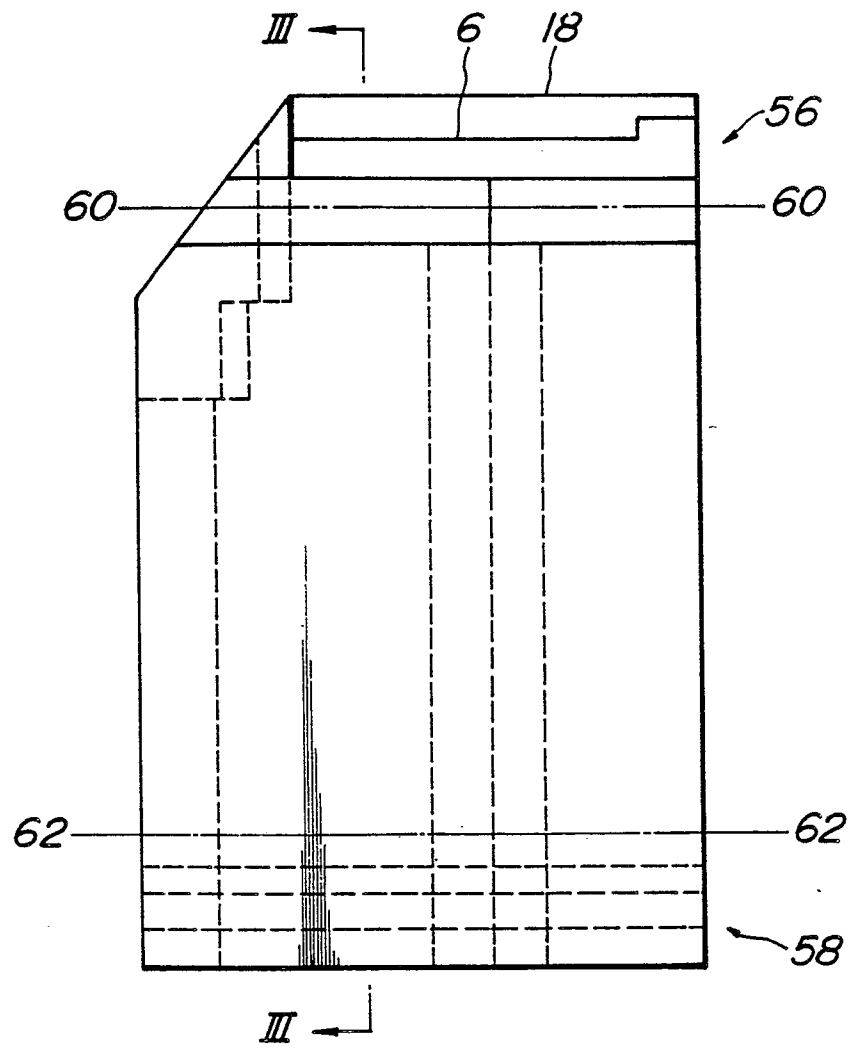


FIG. 3

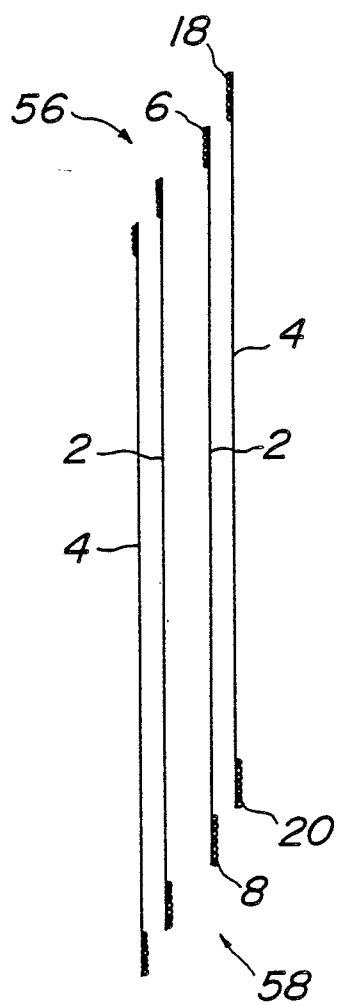


FIG. 4

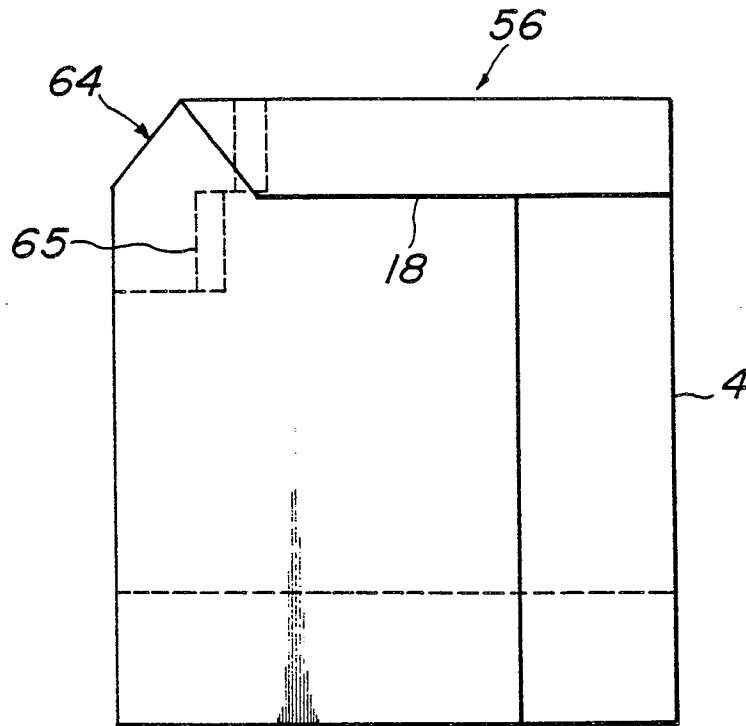


FIG. 5

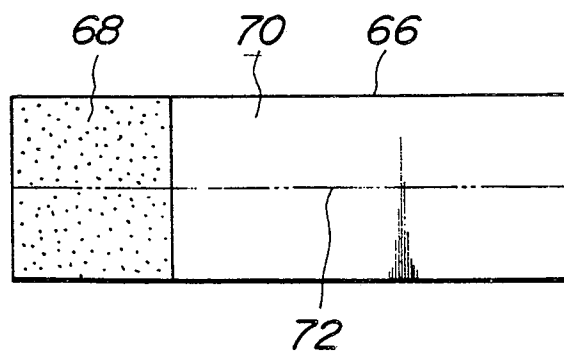


FIG. 6

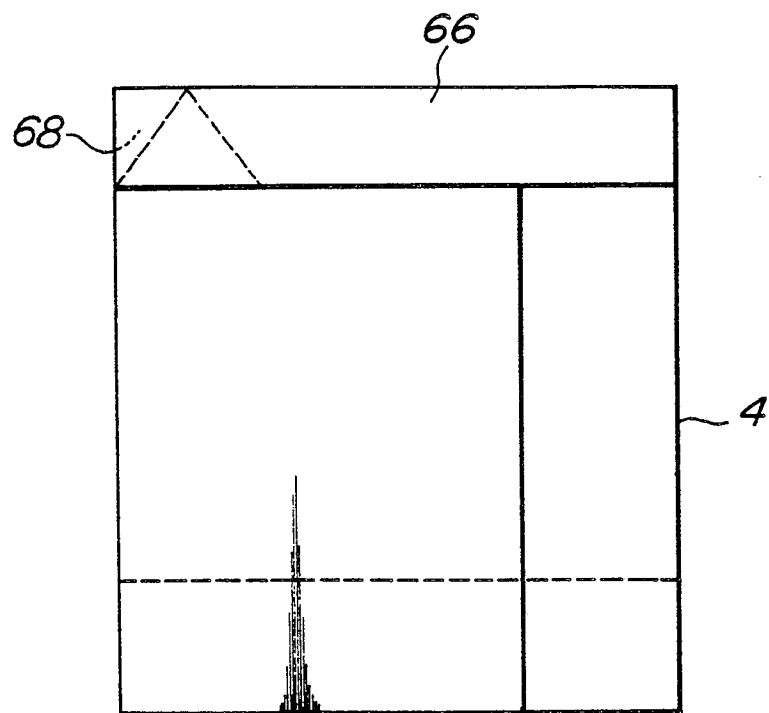


FIG. 7

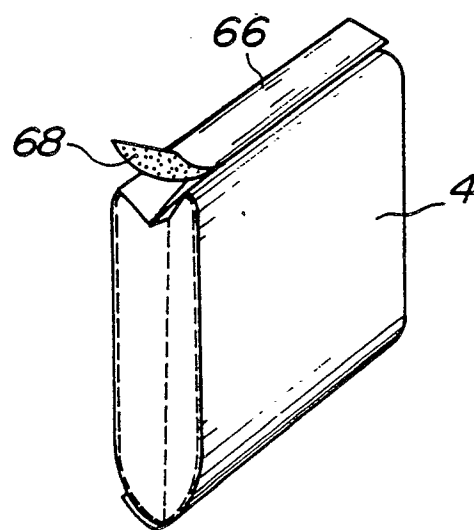


FIG. 8

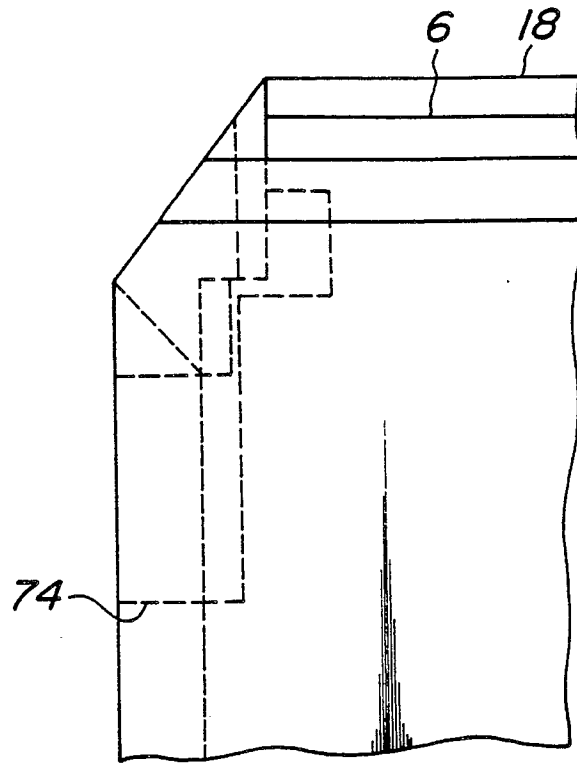


FIG. 9

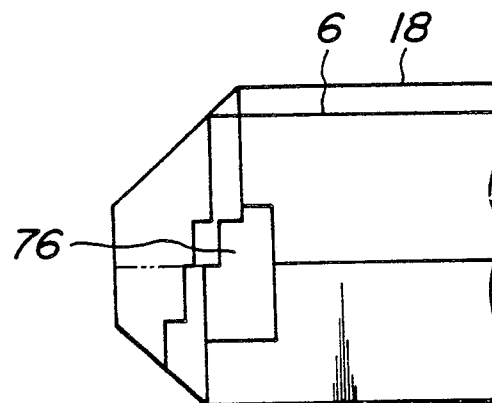


FIG.10

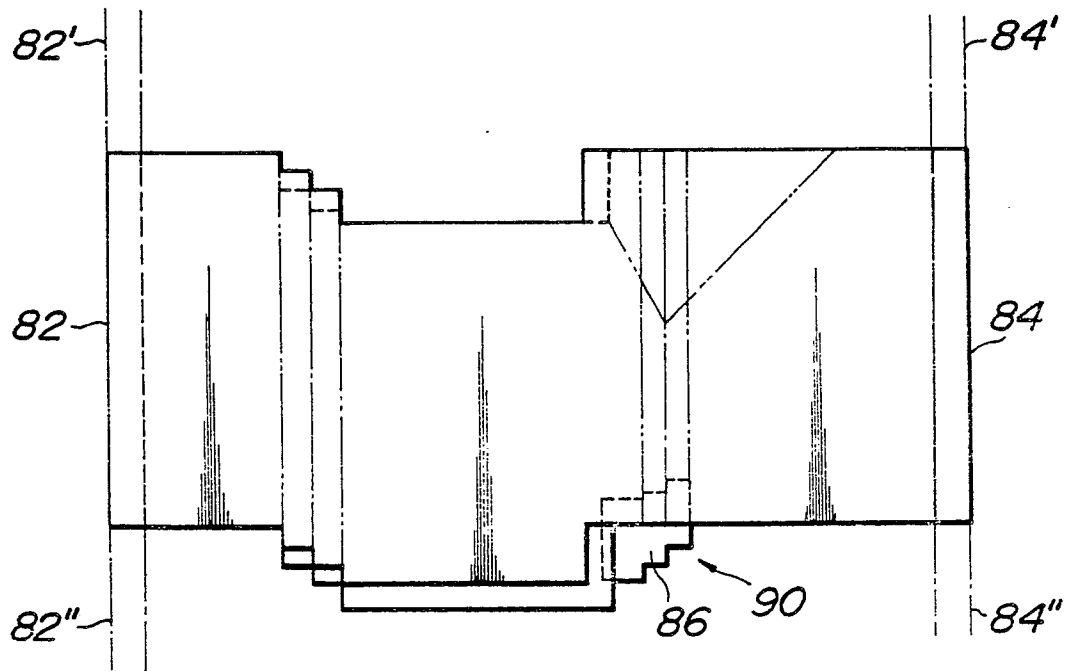


FIG.11

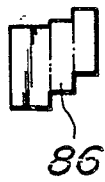


FIG.12

