

(19)



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(11)

EP 0 776 828 A2

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
04.06.1997 Bulletin 1997/23

(51) Int. Cl.<sup>6</sup>: B65B 1/00

(21) Application number: 96308596.4

(22) Date of filing: 28.11.1996

(84) Designated Contracting States:  
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE

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(30) Priority: 29.11.1995 NZ 95280135

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**(54) Method of applying a closure to a bag**

(57) The invention consists in a method of applying a closure to a bag. The method comprises the steps of forming individual bags from a web of material moving in a first direction, providing an elongated closure element, moving the elongated closure member in the direction of its longitudinal axis in a second direction, and sequentially applying the closure element to the

mouth of individual bags. The closure element is then sealed to the bag and the closure element is cut between individual bags. The first direction and the second direction are not substantially parallel. The invention also includes a bag made by the claimed method.

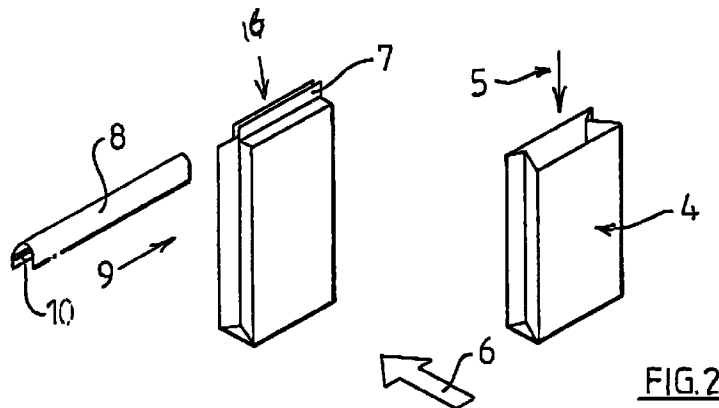


FIG. 2

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## Description

This invention relates to a method of applying a closure to a bag and/or a bag and has been devised particularly though not necessarily solely for the use in applying a closure to a gusseted bag.

The application of closures particularly closures of the type which use a reclose element or zipper is in some circumstances difficult. This arises because the usual methods of applying such a closure to a bag are to bring the bag material and the closure elements together with the strip of closure material and the web of material which will form the bags moving in substantially parallel directions. This enables a substantially continuous process to be effected. Either the closures can be applied and the bags filled from the bottom or the closure can be applied in an open formation and the bag filled from the top before the bag is reclosed.

Accordingly attempts to apply reclose elements to the mouth of a gusseted bag involve a high degree of manual labour and are therefore not desirable. This arises because the gusset must be formed before the reclose element is attached which does not allow simple substantially continuous processes to be used.

Accordingly it is an object of the present invention to provide a method of applying a closure to a bag and/or a bag which will obviate or minimise the foregoing disadvantages in a simple yet effective manner or which will at least provide the public with a useful choice.

Accordingly in one aspect the invention consists in a method of applying a closure to a bag comprising the steps of forming individual bags from a web of material moving in a first direction, providing an elongated closure element or elements, moving the elongated closure element or elements in the direction of its longitudinal axis in a second direction, sequentially applying the closure element or elements to the mouth of individual bags, sealing the closure element or elements to the bag and cutting the closure element or elements between individual bags, the first direction and the second direction not being substantially parallel.

Preferably the bag is filled before said closure element or elements is applied.

Alternatively the bag is filled after the closure element or elements is applied.

Preferably the angle between the first direction and the second direction is substantially a right angle.

Preferably the method further includes the step of sealing the bag to provide a substantially hermetic seal.

Preferably the bag comprises a gusseted bag.

Preferably the closure element or elements comprises a strip or tape of material having mutually engageable reclose elements thereon.

In a further aspect the invention may broadly be said to consist in a bag when formed by a method according to any one of the preceding paragraphs.

To those skilled in the art to which the invention relates, many changes in construction and widely differ-

ing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

One preferred form of the invention will now be described with reference to the accompanying drawings in which:

**Figure 1:** is a diagrammatic figure showing the direction of movement of material to form gusseted bags,

**Figure 2:** is a diagrammatic representation of steps to apply a reclose element to the mouth of a gusseted bag,

**Figure 3:** is a larger view of a closed bag according to the invention, and

**Figure 4:** is a diagrammatic representation of an alternative embodiment of the invention.

When used herein the term bag is sufficiently broad to cover a tube of material at each end from which a closed bag will be formed.

Referring to the drawings gusseted bags are formed by forming a tube of material, squeezing inwardly opposite parts of the bag into a flattened formation to provide a construction such as substantially shown at 1 in figure 1. The web so formed will be drawn off in a direction along the longitudinal axis of the web, for example, in the direction of arrow 2. In an alternative embodiment the bag may be formed by taking a sheet of film, folding it and sealing the free edges before forming the gussets substantially as above described. As the web moves the bottom of the bag can be cut and sealed, for example, substantially at position 3 in figure 1. The making is shown substantially horizontal but of course could be vertical or other angles in between. The gusseted bag 4 formed by the above process is shown in figure 2 and the bag is filled in the direction of arrow 5. The bags are moving in the direction of arrow 6 which may be in the same direction as the arrow 2.

The edges 7 of the mouth of the bag are brought together as indicated at 16 in figure 2 and a closure element strip 8 moving substantially in the direction of arrow 9 is brought into position so that the closure element strip 8 is positioned over the edges 7. Usually the directions 6 and 9 will be at right angles. The closure element may be substantially an inverted U shape in cross-section and include reclose elements 10 which may take the form of a co-operating narrow mouthed groove and a bulbous rib so that the rib can be a snap fit into the groove and also allow for a snap removal. The strip 8 is positioned substantially as shown in figure 3 where the line 9 is the top of the bag and the pecked line 12 shows the position of a seal. In the embodiment shown to achieve a substantially hermetic seal the seal

is substantially parallel to the longitudinal axis of the strip 8 to seal the closure element to the bag but also extends upwardly at each end so as to close the closure element. Heat sealing techniques which are well known can be utilised. In particular the upward extending parts 12a and 12b above described are placed as close as possible to the end of the strip. The strip is then cut substantially at the position of arrow 11 and the bag removed.

The closure element 8 could be replaced by separate strips each having part of the reclosure construction 10 thereon.

Suitable indexing apparatus is provided to co-ordinate the movements of the bag, strip and filling apparatus.

In figure 4 a bag 15 is provided which is moving in the direction of the symbol 16 (that is to say into the page). Alternatively the bag 15 could be moving out of the page. The corner of the bag is cut at line 16 and a strip 8 moving in direction 18 is applied having reclose elements indicated by the dotted line 19. The reclose element is positioned substantially as shown in figure 3 but across the cut off corner of the bag 15. Again a sealing element is provided which seals along lines 20, 20a and 20b to effect a seal. In the constructions of figures 3 and 4 a tear thread 21 can be provided if desired. The movement of the reclose elements in this embodiment is oblique when compared to the movements in Figure 2 but the movements are at a right angle to the direction of movement of the bag.

Although the invention grew out of the difficulty of providing reclose elements or gusseted bags it is clear that the invention can be used with other types of bag including bags that are bottom filled after the reclose element has been applied. Thus bag 4 can be a bag other than a gusseted bag and in such a case the reclose element may be applied to an unfilled bag open at the bottom end for bottom filling. Thus the invention allows reclose elements to be applied to a bag in discrete fashion rather than in a connected chain.

Thus it can be seen that at least in preferred form of the inventions a method of forming a bag is provided in which a reclose element is connected to in particular a gusseted bag although other types of bag can be used. Such a construction is able to be effected in a reliable manner and enables reclose technology to be used with gusseted bags where previously this has proved difficult.

## Claims

1. A method of applying a closure to a bag comprising the steps of forming individual bags from a web of material moving in a first direction, providing an elongated closure element or elements, moving the elongated closure element or elements in the direction of its longitudinal axis in a second direction, sequentially applying the closure element or elements to the mouth of individual bags, sealing the

closure element or elements to the bag and cutting the closure element or elements between individual bags, the first direction and the second direction not being substantially parallel.

2. A method as claimed in claim 1 wherein the bag is filled before said closure element or elements is applied.
3. A method as claimed in claim 1 wherein the bag is filled after the closure element is applied.
4. A method as claimed in any one of the preceding claims wherein the angle between the first direction and the second direction is substantially a right angle.
5. A method as claimed in any one of the preceding claim wherein the method further includes the step of sealing said bag to provide a substantially hermetic seal.
6. A method as claimed in any one of the preceding claim wherein the bag comprises a gusseted bag.
7. A method as claimed in any one of the preceding claim wherein the closure element or elements comprises a strip or tape of material having mutually engageable reclose elements thereon.
8. A bag when formed by a method according to any one of the preceding claims.

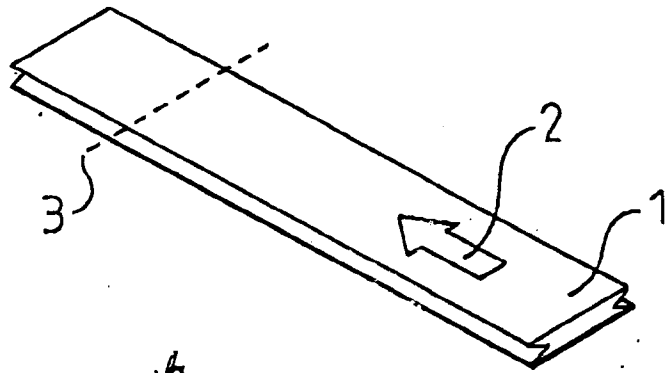


FIG. 1

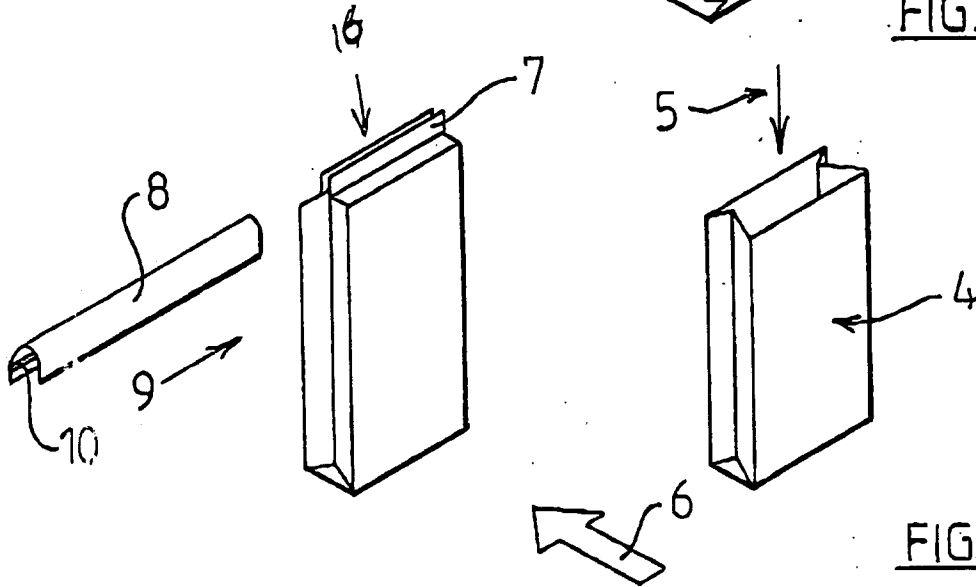


FIG. 2

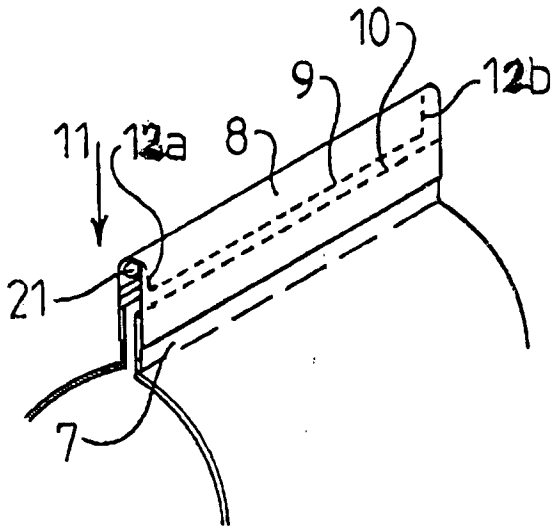


FIG. 3

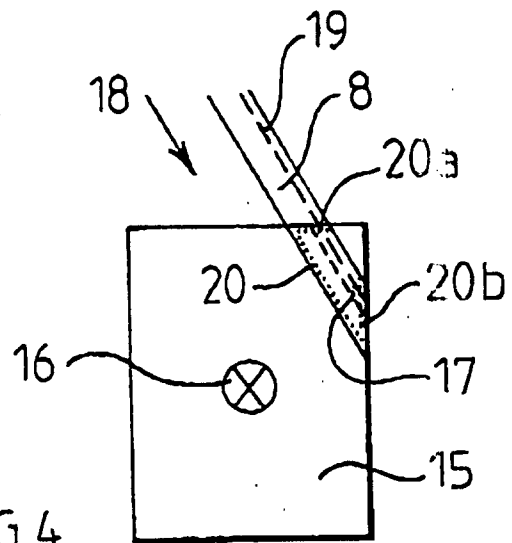


FIG. 4