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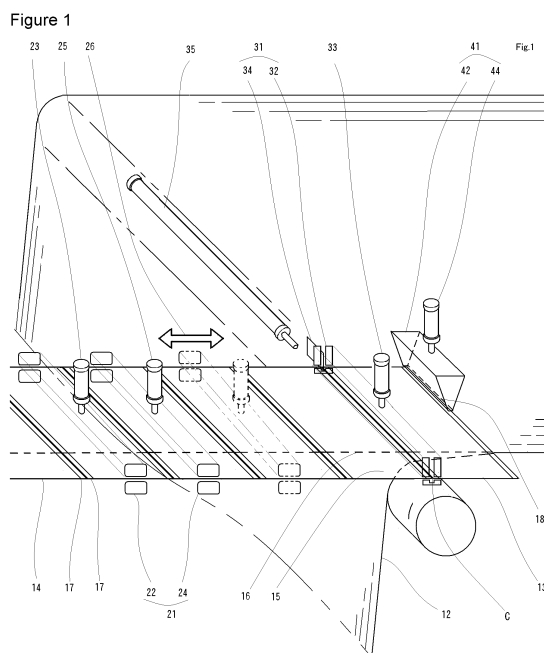
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(54) **PROCESSING METHOD AND PROCESSING DEVICE FOR CONTAINER BODY SHEET**

(57) Provided are a processing method and a processing apparatus in which processing can be carried out effectively at high speeds when a sheet-shaped attachment to be fitted to a sheet for storage body are bonded to a web having the sheets for storage body continuing in the longitudinal direction.

Attachment 13 is bonded to a web 12 in which the sheets for storage body continue in the longitudinal di-

rection. The attachment 13 is fed as a tape 14 continuing in the longitudinal direction. When each of the attachment 13 is cut and bonded to the web 12, the tape 14 is, first, disposed in the thickness direction of the web 12 and the tape 14 is fed along the longitudinal direction of the web 12. In a state that a relative movement of the tape 14 and the web 12 is stopped, a portion of the tape 14 closer to the end thereof is cut and bonded to the web 12.



Description**TECHNICAL FIELD**

[0001] The present invention relates to a method for processing a sheet for storage body and a processing apparatus thereof.

BACKGROUND ART

[0002] Conventionally, in manufacturing a storage body made of a sheet, with an attachment fitted to a sheet for storage body, the sheet is subjected to processing in most cases. For example, Patent Document 1 is such that a check valve made of a sheet is fitted as an attachment on a storage bag for coffee beans, etc. Patent Document 2 is such that a reinforcement sheet is fitted as an attachment around a carrying hole on a shopping bag. A storage body with a check valve includes, for example, a storage bag which stores various types of articles, a fluid retaining bag such as a balloon for storing a gas or a liquid and a toy as well as a buffer capable of using a sealed fluid as a cushion material or a buffer.

[0003] Where an attachment is fitted to a web which continues in a longitudinal direction at which the attachment is fitted, as shown in Patent Document 1 and Patent Document 2, each of the attachment is inserted into an upper face or a lower face of the web from the side of the web and fixed accordingly so as to intersect in the longitudinal direction. More specifically, the attachment which continues in a tape shape are cut off on the side of the web and each of the thus cut off attachment is allowed to move from the side of the web and fixed. However, the above-described method requires carrying out the following three steps separately, that is, a step of cutting the tape, a step of moving the tape and a step of fixing the tape, thereby limiting a reduction in fitting time and speeding-up of fitting work.

[0004] In Patent Document 3, there are disclosed an apparatus and a method in which attachment which continues in the shape of a tape are disposed in a thickness direction of a web and fed in an intermittent manner along the longitudinal direction of the web, a portion of the tape closer to the end thereof is cut for each of the attachment so as to be bonded to the web (Fig. 8 to Fig. 10 in Patent Document 3). However, a roller is used as a unit for feeding the attachment which continues in the shape of a tape in an intermittent manner. The roller is frequently used as a unit for feeding long articles such as a tape in various types of devices. Where these articles are fed intermittently and at high speeds, an actual feed rate deviates from a designed value, etc., and it is difficult to enhance the processing accuracy.

PRIOR ART DOCUMENTS**PATENT DOCUMENTS**

[0005]

Patent Document 1: Japanese Patent No. 2626703

Patent Document 2: Japanese Patent No. 3134083

Patent Document 3: Japanese Patent No. 2691881

SSUMMARY OF THE INVENTION**PROBLEMS TO BE SOLVED BY THE INVENTION**

[0006] An object of the present invention is to provide a method for processing a sheet for storage body in which where a sheet-shaped attachment to be fitted to the sheet for storage body is bonded to a web having the sheets for storage body continuing in the longitudinal direction, a tape in which the attachment continues in the longitudinal direction is cut for each of the attachment and bonded to the web. That is, the present invention is to provide a processing method and a processing apparatus which are capable of carrying out the processing with increased accuracy and also advantageous in carrying out the processing at high speeds.

MEANS FOR SOLVING THE PROBLEMS

[0007] The present invention is to improve a method for processing a sheet for storage body which includes a step in which where a sheet-shaped attachment to be fitted to the sheet for storage body is bonded to a web in which the sheets for storage body continue in the longitudinal direction, a tape in which the attachment continues in the longitudinal direction is cut for each of the attachment and bonded to the web. A gist thereof includes a tape feeding step in which the tape is disposed in the thickness direction of the web and the tape is fed along the longitudinal direction of the web and a step in which a portion of the tape closer to the end thereof is cut and bonded to the web in a state that a relative movement between the tape and the web is stopped.

[0008] The present invention is such that the tape is not fed in a direction intersecting with the longitudinal direction of the web but the tape is fed along the longitudinal direction thereof, thereby substantially eliminating the need of a step in which the cut attachment is inserted from the side of the web. In particular, where the attachment is inserted in the longitudinal direction, that is, in the width direction of the tape, it is possible to decrease a tape feed rate per operation and also to further shorten the time necessary for carrying out the tape feeding step.

[0009] Further, where the tape is fed in a direction intersecting with the longitudinal direction of the web, it is inevitable that the processing apparatus for cutting and feeding the tape is disposed in a state being protruded from a bag-making machine to which the web in itself is

fitted, and this may need a larger area. However, the present invention is such that the tape is fed along the longitudinal direction of the web, thus making it possible to omit a portion which laterally protrudes from the apparatus for processing the web such as the bag-making machine or to dimensionally decrease the portion which protrudes from the apparatus, thereby contributing to downsizing of an entire system.

[0010] As described so far, where the tape feed rate is decreased to further shorten the time necessary for the tape feeding step, the tape is required to be fed with high accuracy. For example, where a storage bag is a check valve, the length thereof is about 5 cm to 10 cm and the width thereof is about 2 cm to 3 cm. Further, the check valve is composed by stacking two to four synthetic-resin made sheets different in lengths and, in some cases, a non-woven cloth for filtering purposes is partially disposed inside, thus resulting in non-uniformity of thickness. Thus, where the attachment small in dimension and non-uniform in thickness is fed by using a rotating unit such as the roller of the tape and in particular where they are attempted to be fed at a low feed rate but at a high speed, it is quite difficult to feed them with high accuracy.

[0011] Therefore, in the present invention, the tape is allowed to move, while being retained by feeding retainers, by which even the tape not uniform in thickness can be fed by accurately controlling a short feeding length. More specifically, the tape feeding step is to include a step in which the tape is retained by using the feeding retainers, a step in which the feeding retainers are allowed to move forward in the longitudinal direction of the tape, with the tape being retained, a step in which the tape is released from being retained by the feeding retainers after the movement, and a step in which the feeding retainers are allowed to move backward in the longitudinal direction of the tape to a position before the movement.

[0012] Then, if there is included a step in which when the feeding retainers keep the tape released, the tape is retained by using the fixing retainers and when the feeding retainers which sandwich the tape therewith is allowed to move forward, the tape which has been retained by the fixing retainers is released, the tape is retained at all times, thus making it possible to further increase the accuracy of the feed rate.

[0013] Further, the present invention includes a cutting step in which the tape is fed into a cutting device which cuts the tape in a direction intersecting with the longitudinal direction thereof and an end of the tape is cut to cut off the attachment and a bonding step in which the attachment is overlaid on the web and bonded to each other, in which the cutting device is provided with a cutting edge and a holding body which is disposed at least at the front or at the rear of the cutting edge. The tape is cut by using the cutting edge in a state that the tape is retained by the holding bodies. Prior to completion of the cutting step, the bonding step is started, by which also

on cutting and fixing, the attachment is retained stably and also the tape can be cut and fixed within a short period of time.

[0014] More specifically, the attachment is provided as a check valve made of a sheet which is provided with a valve flow channel between a plurality of sheets overlaid in the thickness direction, allowing one of inflow and outflow of a fluid between the inside and the outside of a storage body and not allowing the other of inflow and outflow of the fluid. Further, the tape is such that the plurality of check valves are arranged in the longitudinal direction of the tape in such a manner that the width direction of the tape is in parallel with the valve flow channel, and the tape feeding step can be carried out so that the tape is fed forward only by a length equal to the width of the number of check valves to be fitted to one unit of the storage body. Still further, the cutting step can be carried out as a step in which a side edge at the rear side of the check valve is cut off from the end of the tape, and the bonding step can be carried out as a step in which a front side of the check valve is heat-sealed and bonded to the sheet for storage body. As described above, since the side edge at the rear side of the check valve is cut to heat-seal the front side of the check valve, it is possible to simultaneously carry out at least a part of the cutting step and at least a part of the bonding step and to realize processing reliably and at high speeds.

[0015] In addition, the present invention is to improve an apparatus for processing a sheet for storage body which is provided with a bonding device in which a sheet-shaped attachment to be fitted to the sheet for storage body is bonded to a web having the sheets for storage body continuing in the longitudinal direction and a cutting device which cuts the tape having the attachment continuing in the longitudinal direction for each of the attachment. And, the present invention is to provide an apparatus for processing a sheet for storage body which is also provided with a tape feeding device in which the tape is disposed in the thickness direction of the web and the tape is fed in the longitudinal direction of the web, wherein the cutting device is to cut off the attachment by cutting a portion of the tape closer to the end thereof in a state that a relative movement between the tape and the web is stopped and the bonding device is to bond the attachment to the web before completion of the cutting by the cutting device.

EFFECTS OF THE INVENTION

[0016] The present invention is able to provide a method for processing a sheet for storage body and an apparatus thereof in which where a sheet-shaped attachment to be fitted to the sheet for storage body is bonded to a web having the sheets for storage body continuing in the longitudinal direction, a tape having the attachment continuing in the longitudinal direction is cut for each of the attachment and bonded to the web, thereby carrying out processing with improved accuracy and at high speeds.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

Fig. 1 is a perspective view which shows a structure of an apparatus for processing a sheet for storage body according to an embodiment of the present invention.

Fig. 2 shows a processing method by using the apparatus for processing the sheet for storage body, (A) is a drawing which explains a first step, (B) is a drawing which explains a second step, (C) is a drawing which explains a third step, and (D) is a drawing which explains a fourth step.

Fig. 3(A) is a bottom view showing a check valve which is an attachment used in the method for processing the sheet for storage body according to the embodiment of the present invention, (B) is a central transverse sectional view which shows the check valve, and (C) is a bottom view which shows a check valve or a modified example of the temporary fixing seal of (A).

Fig. 4(A) is a sectional view which shows a storage body equipped with the check valve in which the check valve is kept open, (B) is a sectional view which shows the storage body equipped with the check valve in which the check valve is kept closed, and (C) is an essential portion sectional view which shows a modified example of the temporary fixing seal of (A).

MODE FOR CARRYING OUT THE INVENTION

[0018] Hereinafter, a description will be given of the embodiment of the present invention with reference to the drawings.

[0019] <Storage body equipped with check valve> The apparatus for processing a storage body according to the present embodiment is applicable to an apparatus as shown in Fig. 4(A) which manufactures a check-valve equipped storage bag which has a check valve made of a sheet as shown in Fig. 3 and stores agricultural products such as coffee beans that emit a gas. The storage bag is made by fitting the check valve to a sheet for storage body 11 as an attachment 13. In implementing the present invention, the storage bag may be changed in shape and structure in various ways. In this example, the bag is a so-called back sealing bag in which the check valve as the attachment 13 is fitted to one side edge of the sheet for storage body 11 and in making the bag, the check valve is bonded between both side edges of the bag when one side edge is bonded by heat-sealing, etc., to the other side edge.

[0020] The attachment 13 can also be modified in various ways on implementation. In this example, as shown in Fig. 3(B), the attachment is constituted in such a manner that one valve sheet 16 is sandwiched between two main body sheets 15. As shown in Fig. 3(A), both sides

are bonded by side seals 17. It is noted that in individual drawings, in reality, the sheets are overlaid with each other so as to be in contact with each other. However, in the drawings, for giving an easy understanding of the relationship between the sheets, in reality, the sheets are drawn larger in thickness and intervals between them.

[0021] The attachment 13 is such that a space between side seals 17 on both sides is given as a valve channel and firmly contact to the main body sheet 15 to which the valve sheet 16 faces, by which the valve is opened and closed. One end of the valve channel (the left end in Fig. 3 and Fig. 4) is given as an inflow port, and the other end thereof (the right end in Fig. 3 and Fig. 4) is given as an outflow port. A filter 19 made of a non-woven cloth or the like is disposed at the inflow port. As shown in Fig. 4(A), when a fluid flows in from the inflow port, the valve channel is opened, by which the fluid will flow out from the outflow port. As shown in Fig. 4(B), even if the fluid attempts to reversely flow from the outflow port, the valve is closed, by which no fluid will reversely flow from the inflow port. This attachment 13 is realized by making the bag so as to dispose the inflow port inside a storage bag, by which, for example, a gas generated from coffee beans is allowed to flow outside. However, actions of the check valve will prevent any fluid from flowing into the storage bag from outside. It is noted that in order that the check valve will not undergo internal adhesion by heat-sealing when making the bag as previously described, heat-resistant ink 20 is applied on one of the main body sheets 15 for preventing melting thereof, as shown in Fig. 3.

[0022] The processing apparatus of the present embodiment is used for temporarily fixing the attachment 13, that is, the above-described check valve, to a web 12 in which the sheets for storage body 11 continue in the longitudinal direction. By carrying out the processing method thereof, the attachment 13 can be temporarily fixed to the sheet for storage body 11.

[0023] <Summary of the processing apparatus and description of web 12 and tape 14> As shown in Fig. 1, the processing apparatus is provided with a tape feeding device 21, a cutting device 31 and a bonding device 41 as major devices. The attachment 13 is cut off from the tape 14 and fitted to the web 12 by using the processing apparatus.

[0024] The web 12 is a raw material which is processed into the sheet for storage body 11 and provided as a sheet. The web 12 may be various types of sheets such as a single sheet or a laminated sheet composed of one or two or more types of synthetic resin-made film and a sheet made of a composite material such as that made of a synthetic resin and metal foil, paper, a non-woven cloth, etc., with no restrictions on the materials thereof. However, where the attachment is temporarily fixed by heat-sealing, it is desirable that at least one of the faces is composed of a thermoplastic film such as polyethylene which can be easily heat-sealed. Although not illustrated, the web 12 is usually supplied in a wound state and in

the shape of a roll and delivered from the roll by a feeding device and fed in an intermittent manner for each length corresponding to one piece of the sheet for storage body 11.

[0025] While the above-described intermittent feeding is stopped, the processing apparatus of the present embodiment is actuated, by which the attachment 13 is temporarily fixed to one side edge of the web 12 at each predetermined interval. The predetermined interval is an interval of the length corresponding to one piece of the sheet for storage body 11, for example, when one attachment 13 is fitted to each of the sheets for storage body 11, and an interval of the length corresponding to half of the sheet for storage body 11, when two attachments 13 are fitted to each of the sheets for storage body 11 at an equal interval. As so far described, the predetermined interval is set depending on how the web 12 is to be processed, and, as will be described later, it is possible to feed the attachment not in an intermittent manner but in a continuous manner without stopping.

[0026] The attachment 13 is temporarily fixed so that the outflow port protrudes to the outside of a storage bag. The attachment 13 is fitted in such a manner that one end thereof slightly protrudes from the sheet for storage body 11.

[0027] The tape 14 is such that the attachments 13 are formed continuously in the longitudinal direction thereof. The tape is made of a common material used in a sheet-shaped check valve, with no particular restrictions on the material. However, when the attachment 13 is temporarily fixed by heat-sealing, it is desirable that at least one of the faces is composed of a thermoplastic film such as polyethylene which can be easily heat-sealed. The attachments 13 are arranged in such a direction that the width direction of the attachment 13 is given as the longitudinal direction of the tape 14, and each of the side seals 17 is disposed so as to extend in the width direction of the tape 14. Further, the attachments 13 are formed so that a side seal 17 of one unit of the attachment 13 is adjacent to a side seal 17 of one unit of the attachment 13 and they continue in this manner in the width direction. The tape 14 is also wound in the shape of a roll and delivered in an intermittent manner by using the tape feeding device 21. It is noted that in this example, the tape 14 is delivered from the roll in such a manner that the tape 14 is pulled by the tape feeding device 21. However, the tape may be delivered by using another feeding device. Further, in the drawing, the tape 14 is overlaid on the upper face of the web 12. It is acceptable that the tape is overlaid on the lower face of the web 12. It is also acceptable that the web 12 and the tape 14 are disposed in a vertical direction and they are fed upward or downward for processing. Still further, it is acceptable that the web 12 and the tape 14 are disposed obliquely and they are freely changed in their positional relationship. Thus, in describing the present invention, it is to be understood that back and forth, vertical and lateral directions only represent a relative positional relationship and do not

specify an absolute position.

[0028] <Entire arrangement> In the processing apparatus of the present embodiment, the tape feeding device 21, the cutting device 31 and the bonding device 41 are arranged from the upstream to the downstream of the tape 14. And, the tape 14 is overlaid on the web 12 between the cutting device 31 and the bonding device 41.

[0029] <Tape feeding device 21> The tape feeding device 21 is provided with fixing retainers 22 disposed on the upstream and feeding retainers 24 disposed on the downstream side thereof. The fixing retainers 22 are to sandwich and hold the tape 14 between both sides in the thickness direction and formed in the shape of a rod, the cross section of which is substantially rectangular, as shown in the drawing. However, the fixing retainers 22 may be formed in another polygonal column shape, in a roller shape with a circular cross section or formed so as to be dimensionally different on both sides in the thickness direction. Further, the feeding retainers 24 shown in Fig. 1 are such that it continues in the width direction of the tape 14. It is also acceptable that the feeding retainers 24 are to sandwich and hold the tape 14 partially at one site or at a plurality of sites of the tape 14. The feeding retainers 24 may be modified as appropriate, as long as they are able to retain the tape 14.

[0030] The fixing retainers 22 are to sandwich/hold and release the tape by using a fixing actuator 23. In this example, the fixing actuator 23 is implemented as an air cylinder for allowing one of the fixing retainers 22 (upper retainer) to move vertically. It is, however, acceptable that the fixing actuator 23 is implemented as an air cylinder for allowing the other of the fixing retainers 22 (lower retainer) to move vertically or as an air cylinder for allowing both of the fixing retainers 22 to move vertically. Further, the fixing retainers 22 may sandwich/hold and release the tape by using an electromagnet in place of the air cylinder. It is also acceptable that the tape 14 is retained not by being sandwiched and held but by air suction.

[0031] The feeding retainers 24 are, as with the above-described fixing retainers 22, to retain and release the tape 14 by using a feeding actuator 25. The feeding retainers 24 and the feeding actuator 25 can be described in the same manner as the fixing retainers 22 and the fixing actuator 23 have been described but they are different in that the feeding retainers 24 are allowed to move back and forth by a feeding mover 26, although the fixing retainers 22 do not move back and forth (upstream side and downstream side). More specifically, as the feeding retainers 24 and the feeding actuator 25, there may be used a device in which rotational motion of a motor or the like is converted to linear motion by using a crank/piston mechanism or the like, or there may also be used a fluid pressure device such as an air cylinder and a device which utilizes an electromagnet, etc. The amount of the movement is equal to a lateral width of one unit of the attachment 13 (length between the side seal 17 and the side seal 17) and, more specifically, the amount of the

movement is about 2 cm to 3 cm, to which the present invention shall not be limited.

[0032] <Cutting device 31> The cutting device 31 is a device for cutting a portion of the tape 14 closer to the end thereof fed by the tape feeding device 21 to cut off the portion as one unit of the attachment 13. The cutting device 31 is provided with a cutting edge 34 and holding bodies 32 which holds the tape 14 at least at the front or at the rear of the cutting edge 34 (in this example, both at the front and the rear thereof). The holding bodies 32 are, as with the previously described fixing retainers 22, to retain and release the tape 14 by using a holding actuator 33. The holding bodies 32 and the holding actuator 33 can be described in the same manner as the fixing retainers 22 and the fixing actuator 23 have been described but they are different in that since the web 12 is brought close in the thickness direction, they are formed in a compact manner and in that in particular in this case, a space between a front sandwiching/holding part and a rear sandwiching/holding part is recessed in a groove shape for sandwiching/holding the front and rear of the cutting edge 34.

[0033] The cutting edge 34 is to cut the tape 14 which is held by the holding bodies 32 in the width direction. More specifically, it is to cut a portion between the side seal 17 and the side seal 17 of mutually adjacent attachments 13. In this example, there is adopted such an arrangement that the cutting edge 34 is allowed to move from one side edge to the other side edge in the width direction of the tape 14 (lateral direction in Fig. 1) by using a cutter actuator 35. It is also acceptable that a cutter having a length equal to or greater than the width of the tape 14 is allowed to move in the thickness direction of the tape 14 (vertical direction in Fig. 1) to cut the tape 14. There are no particular restrictions on the cutter actuator 35, and the following devices may be appropriately selected and used, that is, a device in which rotational motion of a motor or the like is converted to linear motion by a crank/piston mechanism, a fluid pressure device such as an air cylinder, and a device which utilizes an electromagnet, etc.

[0034] <Bonding device 41> The bonding device 41 is to allow the thus cut off attachment 13 to melt and adhere to the web 12 and provided with a seal mold 42 for melting the attachment 13 and a receiving mold 43. Melting is generally carried out by heat melting but may be carried out by other means such as ultrasonic melting. Further, bonding may be performed by using an adhesive agent, besides heat-sealing. The seal mold 42 is allowed to move in the thickness direction of the attachment 13 by using a seal actuator 44. An actuator similar to the holding actuator 33 or the like may be used as the seal actuator 44.

[0035] The attachment 13 is fixed by bag-making by using the sheet for storage body 11 as a subsequent step and completely fixed by back sealing finally. A temporary fixing seal 18 provided by the bonding device 41 is to fix the attachment 13 so that the attachment 13 will not go

out of alignment during bag-making work.

[0036] The temporary fixing seal 18 may be fixed at any given site, as appropriately changed and selected. As shown in Fig. 3(A), the temporary fixing seal 18 can be formed at the end side of the attachment 13 in a feeding direction, in particular on the side seal 17 at the end side thereof. It is noted that the arrow given in Fig. 3 (A) indicates a direction at which the attachment 13 (that is, the tape 14) is fed. Thereby, it is possible to attain a flow rate of the check valve as designed without adversely affecting valve functions of the attachment 13.

[0037] Further, as shown in Fig. 3(C) and Fig. 4(C), it is acceptable that in place of the side seals 17, the main body sheet 15 of the tape 14 and the sheet for storage body 11 are fixed by using the temporary fixing seal 18. Thereby, even where the bag is used after completion of bag-making, the check valve in its entirety which is the attachment 13 is less likely to be detached from the sheet for storage body 11, thus making it possible to reduce the possibility that the check valve is accidentally distorted by contents of the bag. In this case, the filter 19 can be fixed together. It is, however, desirable that the heat-resistant ink 20 is applied on a larger area so that the filter 19 is not heat-sealed. Thereby, on discharge of a gas, the main body sheet 15 is kept fixed to the sheet for storage body 11 and only the filter 19 is easily and extensively spread, by which an inner gas can be favorably discharged to the outside.

[0038] <Processing method> Next, a description will be given of the processing method by using the apparatus with main reference to Fig. 2.

<First step> As shown in Fig. 2(A), when a sensor 27 such as a photo-electric cell reads a mark formed on the tape 14 by printing or other means, a series of processing steps will be actuated. The feeding retainers 24 which are at a retracted position are first closed by using the feeding actuator 25 and the tape 14 is sandwiched and retained by being held in the thickness direction, etc. In this state, the fixing retainers 22 are kept open.

[0039] <Second step> Next, as shown in Fig. 2(B), in a state that the tape 14 is retained by the feeding retainers 24, the feeding mover 26 is used to allow the feeding retainers 24 to move forward in the longitudinal direction of the tape. The forward amount of the feeding retainers 24 is to be substantially equal to a lateral width of one unit of the attachment 13. It is noted that on the above-described forward movement, the fixing retainers 22 keep the tape 14 released. In the present embodiment, the tape 14 is not fed by rotating a rotating unit such as a roller but the tape 14 is fed in a state that the tape 14 is retained by using the feeding retainers 24. As a result, it is possible to accurately control the feed rate. In particular, if the tape 14 is non-uniform in thickness at a short feed rate of about 2 cm to 3 cm corresponding to the width of one unit of the attachment 13, there is a possibility that the feed rate may be made unstable by using the rotating unit such as a roller. However, the present embodiment is able to solve this problem.

[0040] <Third step> Next, as shown in Fig. 2(C), there are carried out a step in which the feeding actuator 25 is used to keep the feeding retainers 24 released while being spaced away from the tape 14, a step in which the fixing actuator 23 is used to retain the tape 14 by the fixing retainers 22, and a step in which the holding actuator 33 is used to hold the tape 14 by the holding bodies 32. The tape may be released and retained at the same time. However, it is desirable that the feeding retainers 24 release the tape at least after the tape has been retained by the fixing retainers 22 or the tape has been retained by the holding bodies 32. It is, thereby, possible to keep the tape 14 retained at all times and also to realize accurate control.

[0041] <Fourth step> Finally, as shown in Fig. 2(D), there are carried out a step in which while the tape is kept retained by the fixing actuator 23, the feeding retainers 24 which keep the tape released are allowed to move backward to a retracted position by the feeding mover 26, a cutting step in which the tape 14 is cut by the cutting edge 34, and a bonding step in which bonding is performed by the bonding device 41. As described so far, while the feeding retainers 24 are allowed to move forward and backward, the cutting step and the bonding step are carried out. Thus, it is possible to efficiently carry out processing and also to reduce the processing time. In particular, the tape 14 is fed by aligning in advance a position of the tape 14 in the width direction of the web 12 with a position at which the attachment 13 is fixed, thereby eliminating a necessity for positioning the attachment 13 in the width direction in the processing step.

[0042] The cutting step in which the tape 14 is cut by the cutting edge 34 is such that the previously described cutter actuator 35 is actuated to cut a portion of the tape 14 closer to the end thereof and cut off one unit of the attachment 13. More specifically, a portion between the side seal 17 at the rear side of the attachment 13 to be cut off and the side seal 17 at the front side of the following attachment 13 (at the position of C in Fig. 1) is cut.

[0043] The bonding step in which bonding is effected by the bonding device 41 is such that an end of the attachment 13 to be cut is overlaid on the web 12 and bonded thereto, and the seal actuator 44 is used to sandwich the attachment 13 and the web 12 between the seal mold 42 and the receiving mold 43, thereby effecting bonding. It is acceptable that the cutting step and the bonding step are carried out at the same time. It is, however, desirable that before the attachment 13 is completely cut by the cutting edge 34, the attachment 13 and the web 12 are at the latest kept sandwiched between the seal mold 42 and the receiving mold 43 (a state that both molds 42 and 43 are closed, although bonding may not necessarily be completed). As described above, before the attachment 13 is cut off from the tape 14, the attachment 13 and the web 12 are positioned by the seal mold 42 and the receiving mold 43 and retained as they are, thus making it possible to effect the bonding at an accurate position.

[0044] In this bonding step, the attachment 13 which is to be cut off is fixed on the front side (in particular desirable is a position of the side seal 17 at the front side). Therefore, the previously described cutting step and the bonding step can be substantially at the same time performed for the attachment 13, the width of which is short as much as 2 cm to 3 cm.

[0045] The above-described fixing in the bonding step is such that the seal mold 42 is pressed from the side of the attachment 13 to carry out processing such as heating and adhesion. On the contrary, it is possible that the seal mold 42 is pressed from the side of the web 12 to carry out processing such as heating and adhesion. However, the processing in which the seal mold 42 is pressed from the side of the attachment 13 to effect heating and adhesion is more advantageous in that heat-sealing can be performed at the same temperature setting, if the same attachment 13 is processed, even where a sheet used for the web is changed in thickness, material, etc.

[0046] After completion of the bonding step, the web 12 to which the attachment 13 has been fixed is fed to a subsequent step for bag-making. On the other hand, the tape 14 is returned to an original state shown in Fig. 2(A) and, thereafter, processing for a next attachment 13 is repeated. It is noted that, for bag-making, it is acceptable that only the bags are completed with no contents filled or it is also acceptable that contents are filled during the bag-making process and the contents are stored in the bags when the bags are completed. Further, bag-making is not performed but the web 12 is temporarily wound up in the shape of a roll so as to be stored and transferred.

[0047] <Modified example> In the above-described embodiment, a relative relationship between the web 12 and the tape 14 is stopped at least while the bonding step is in progress. In particular for stable operation, it is possible to substantially stop the feeding of the web 12 in a whole step shown in Fig. 2(A) to (D). When processing is performed at high speeds, it is acceptable that feeding of the web 12 is stopped only in the bonding step. In the bonding step as well, the processing apparatus including the bonding device 41 is allowed to move forward in synchronization with a feed rate of the web 12, by which the web 12 and the attachment 13 are relatively stopped. It is, thereby, possible to carry out processing at even higher speeds.

[0048] In the previously described embodiment, the check valve made of a sheet is used as the attachment 13. As the attachment, there may be adopted various types of articles such as a sheet for reinforcing a bottom face or a carrying hole of a shopping bag and a carrying handle. As described so far, the attachments 13 and the tape 14 on which the attachments 13 are continuously provided can be made of a single sheet of a synthetic resin-made sheet, metal foil, paper, non-woven cloth, knitted fabric and woven textile or a composite material thereof and may be changed in any material, as appropriate. The materials are allowed to contain a pharmaceutical and a chemical having various functions and ef-

fects. It is acceptable that a substance exhibiting various functions and effects is disposed between a plurality of sheets. It is also acceptable that the attachment 13 may be provided exclusively in view of design or the attachment 13 may give mechanical characteristics such as strength. The present invention shall not be understood so as to be limited by purposes for imparting the attachment 13 or by actions and effects thereof.

[0049] In the above-described example, a reinforcement body is fitted at a position close to a side edge of the web. The reinforcement body may be fitted at the center, and the web can be set at any position in the width direction thereof. Even where it is set at a different position, processing can be carried out at the same speed as that of the previously described example.

DESCRIPTION OF REFERENCE NUMERALS

[0050]

- 11: sheet for storage body
- 12: web
- 13: attachment (check valve)
- 14: tape
- 15: main body sheet
- 16: valve sheet
- 17: side seal
- 18: temporary fixing seal
- 21: tape feeding device
- 22: fixing retainer
- 23: fixing actuator
- 24: feeding retainer
- 25: feeding actuator
- 26: feeding mover
- 31: cutting device
- 32: holding body
- 33: holding actuator
- 34: cutting edge
- 35: cutter actuator

Claims

1. A method for processing a sheet for storage body, where a sheet-shaped attachment to be fitted to the sheet for storage body is bonded to a web having the sheets for storage body continuing in a longitudinal direction, comprising:

a tape feeding step in which a tape having the attachment continuing in the longitudinal direction is disposed in the thickness direction of the web and fed along the longitudinal direction of the web; and

a bonding step in which a portion of the tape closer to the end thereof is cut for each of the attachment and bonded to the web in a state that a relative movement between the tape and

the web is stopped, **characterized in that** the tape feeding step is comprised of:

- a step in which the tape is retained by using a feeding retainer;
- a step in which the feeding retainer is allowed to move forward in the longitudinal direction of the tape, with the tape being retained;
- a step in which the tape is released from being retained by the feeding retainer after the movement; and
- a step in which the feeding retainer is allowed to move backward in the longitudinal direction of the tape to a position before the movement.

2. The method for processing the sheet for storage body according to Claim 1, **characterized in that** the method is comprised of a step in which, when the feeding retainers keep the tape released, the tape is retained by using the fixing retainers and, as well, when the feeding retainers which sandwich the tape therewith is allowed to move forward, the tape which has been retained by the fixing retainers is released.

3. The method for processing the sheet for storage body according to Claims 1 or 2, **characterized in that** the method is comprised of a cutting step in which the tape is fed into a cutting device which cuts in a direction intersecting with the longitudinal direction of the tape and an end of the tape is cut to cut off the attachment, and a bonding step in which the attachment is overlaid on the web and bonded to each other, wherein the cutting device is provided with a cutting edge and a holding body which is disposed at least at the front or at the rear of the cutting edge, and the tape is cut by using the cutting edge in a state that the tape is retained by the holding bodies, wherein the bonding step is started before completion of the cutting step.

4. The method for processing the sheet for storage body according to Claim 3, **characterized in that** the attachment is a check valve made of a sheet which is provided with a valve flow channel between a plurality of sheets overlaid in the thickness direction, allowing one of inflow and outflow of a fluid between the inside and the outside of a storage body formed with the sheet for storage body and not allowing the other of inflow and outflow of the fluid, the tape is such that the plurality of check valves are arranged in the longitudinal direction of the tape in such a manner that the valve flow channel is in parallel with the width direction of the tape,

the tape feeding step is to feed the tape forward only by the same length as the width of the number of check valves to be fitted to one unit of the storage body, and

the cutting step is to cut off a side edge at the rear side of the check valve from the end of the tape, and the bonding step is to bond the front side of the check valve to the sheet for storage body by heat-sealing.

5. An apparatus for processing a sheet for storage body provided with a bonding device in which a sheet-shaped attachment to be fitted to the sheet for storage body is bonded to a web having the sheets for storage body continuing in the longitudinal direction, and a cutting device in which the tape having the attachment continuing in the longitudinal direction is cut for each of the attachment, **characterized in that** the processing apparatus is comprised of a tape feeding device in which the tape is disposed in the thickness direction of the web and fed in the longitudinal direction of the web, wherein the cutting device is to cut off the attachment by cutting a portion of the tape closer to the end thereof in a state that a relative movement between the tape and the web is stopped, and the bonding device is to bond the attachment to the web before completion of the cutting by the cutting device.

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Figure 1

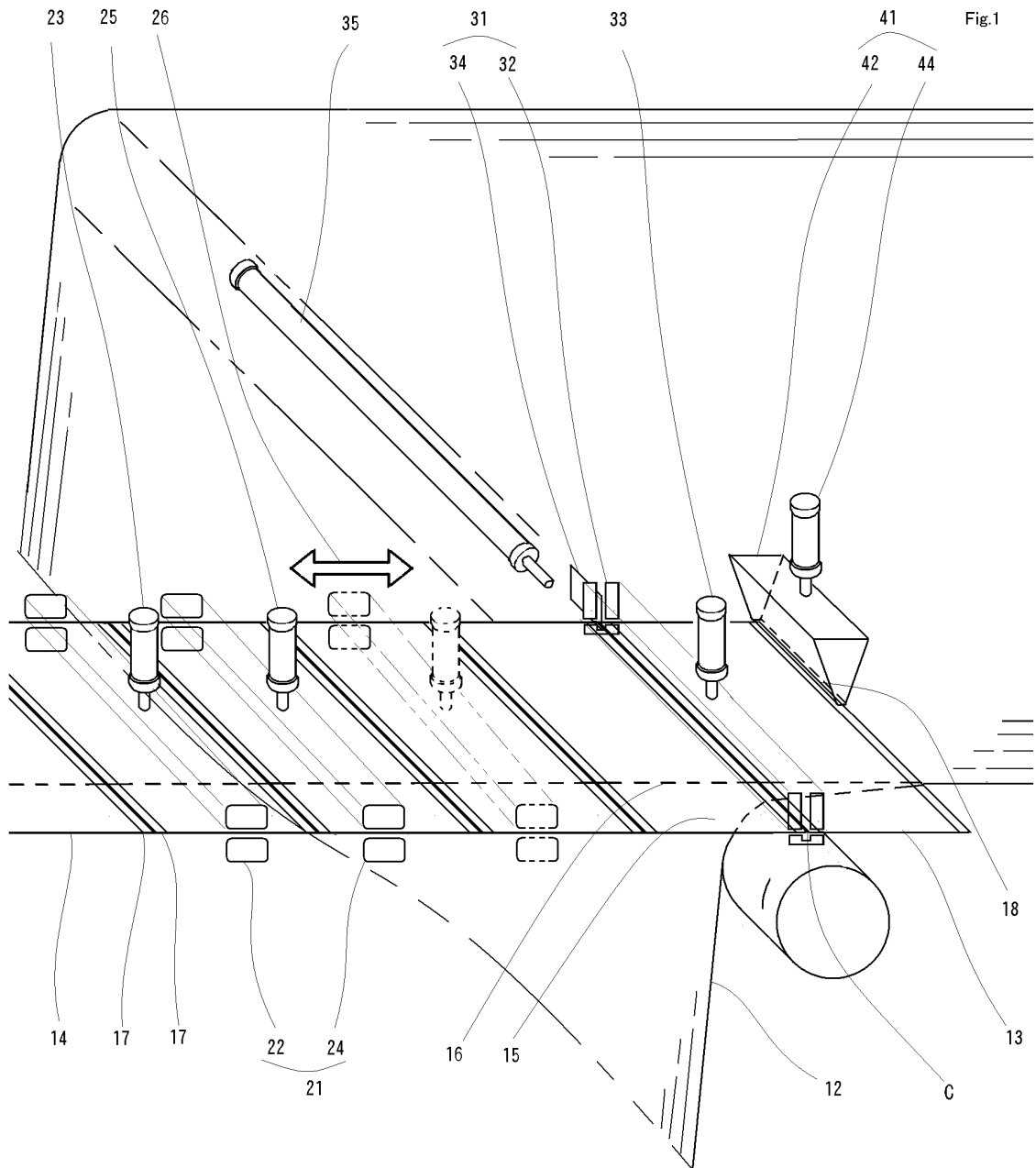


Figure 2

Fig.2

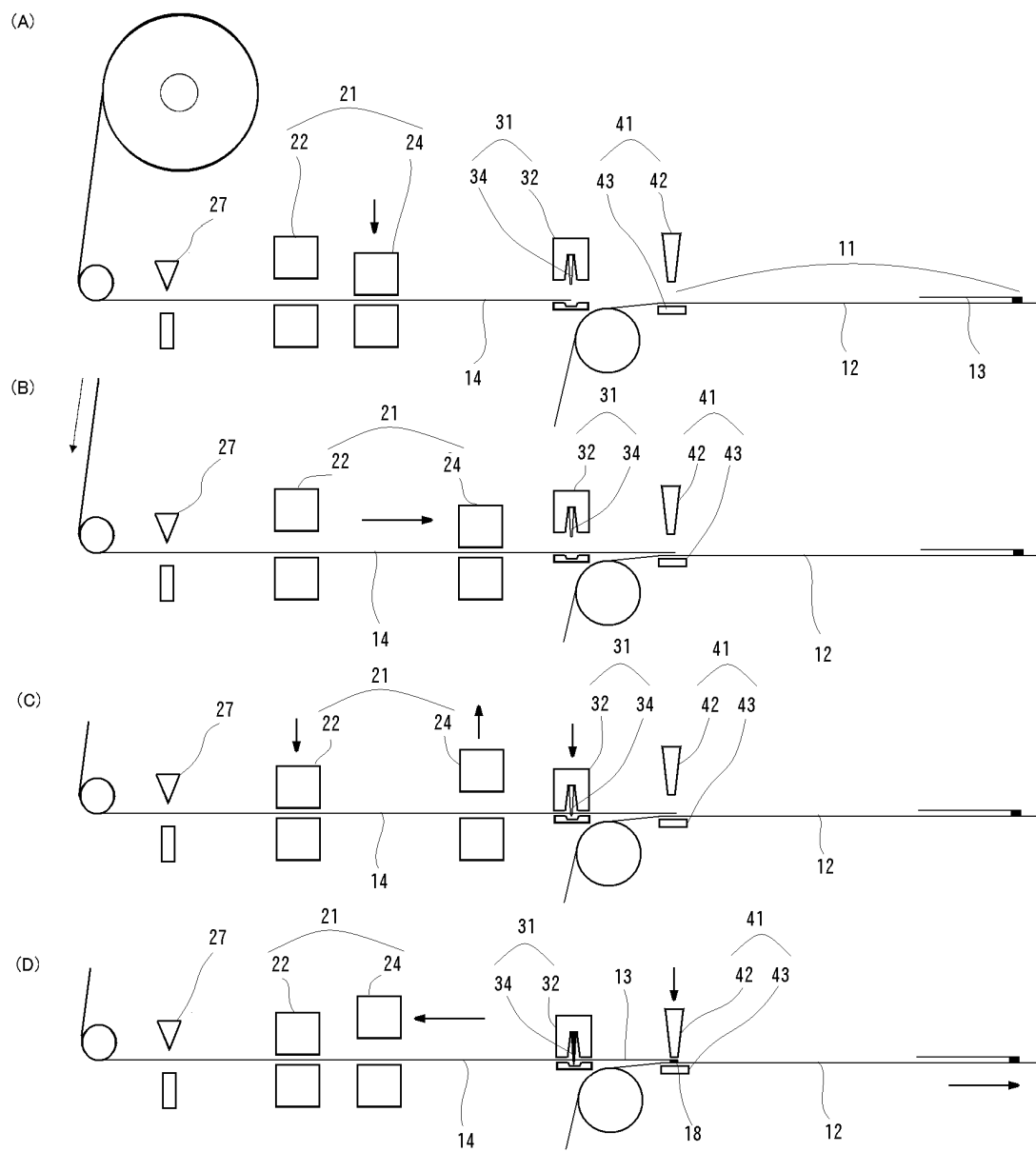


Figure 3

Fig.3

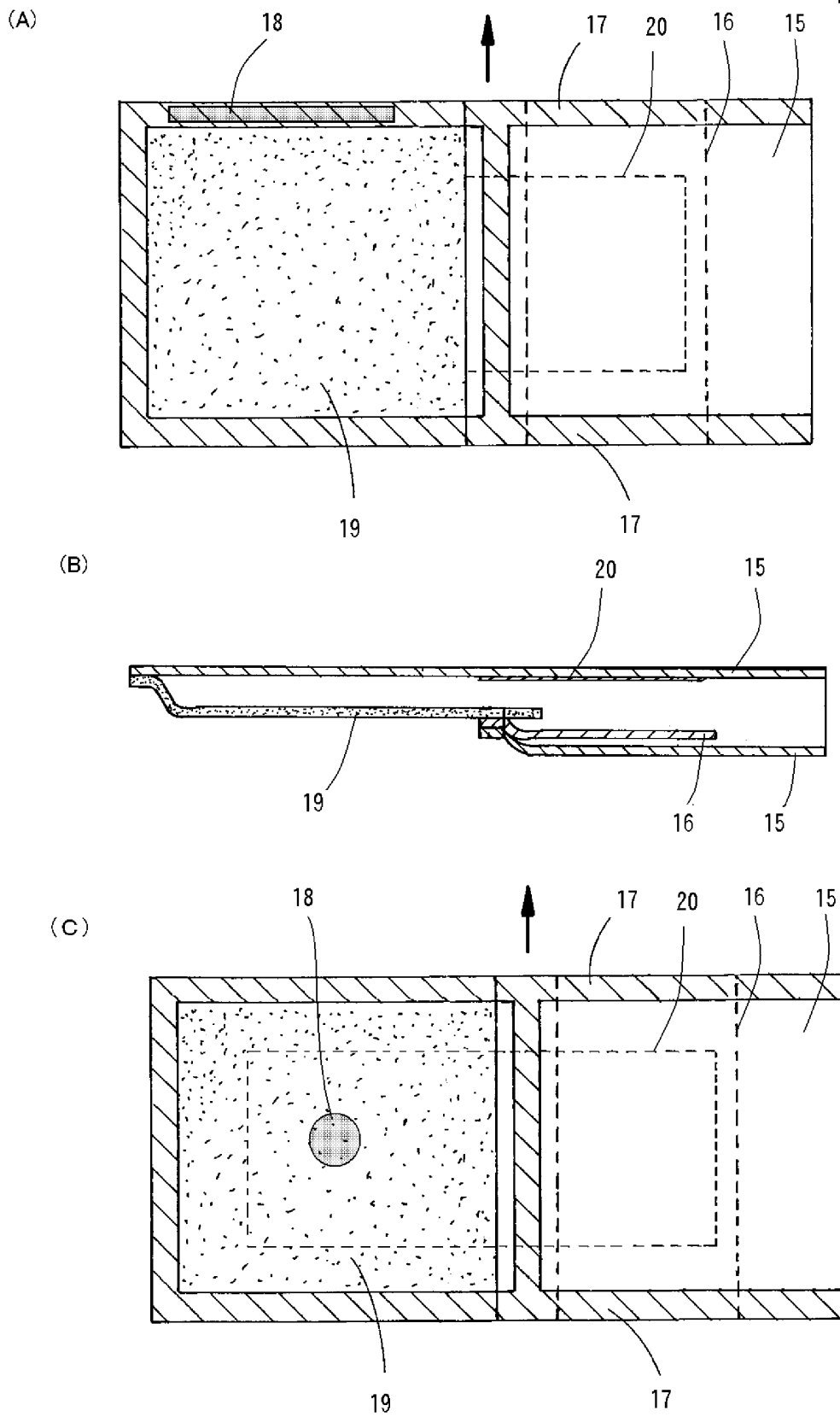
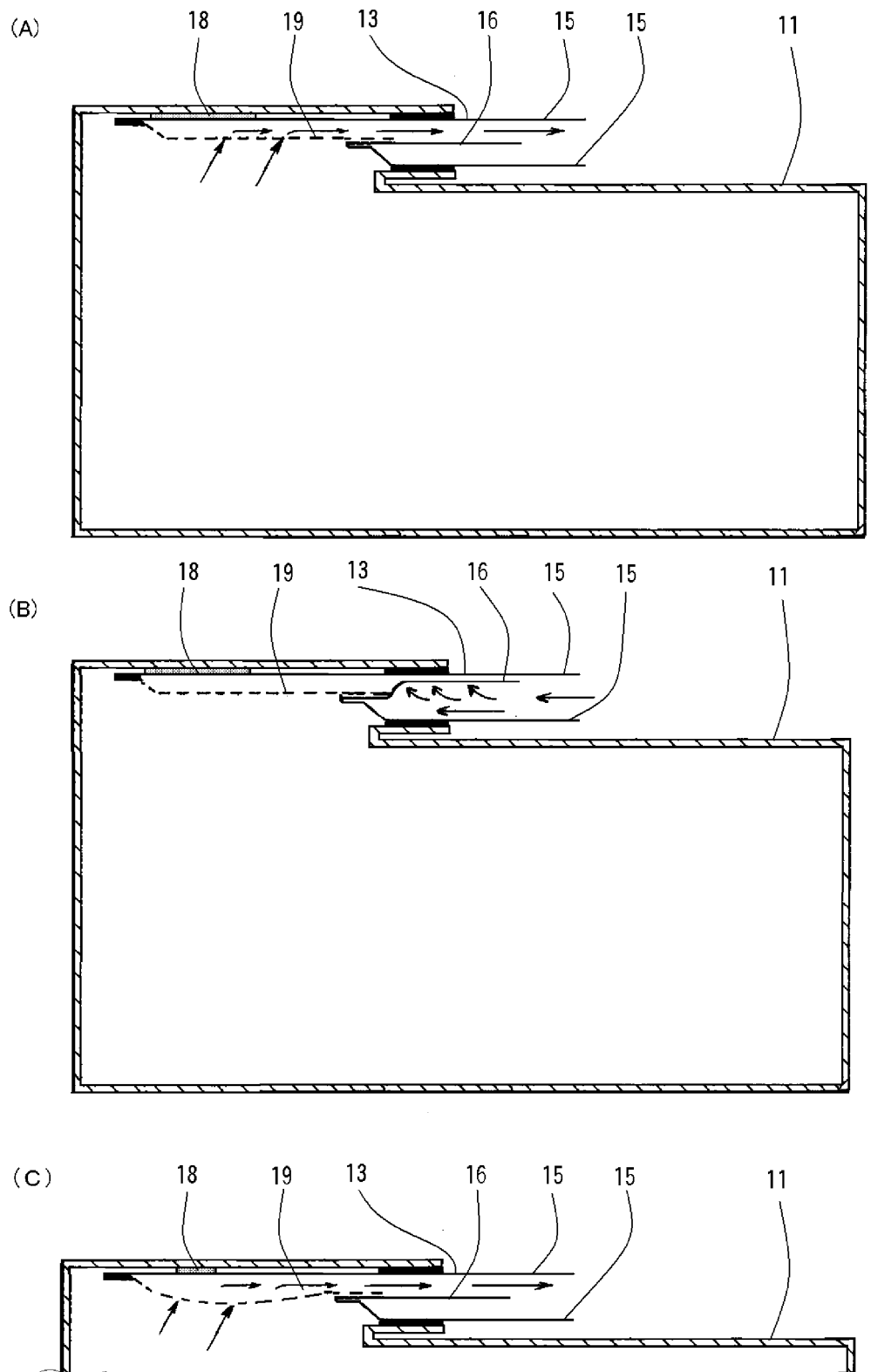


Figure 4

Fig.4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/054590

A. CLASSIFICATION OF SUBJECT MATTER

B31B1/84(2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B31B1/00-49/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2013

Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2001-138412 A (Yamagata Gravure Co., Ltd.), 22 May 2001 (22.05.2001), paragraphs [0018] to [0042]; fig. 2 to 3 (Family: none)	5 1-4
Y	JP 5-212820 A (Tetra Alfa Holdings S.A.), 24 August 1993 (24.08.1993), paragraphs [0015] to [0026]; fig. 1 to 2 & CA 2050704 A1 & CN 1059877 A & SE 466952 B & EP 476374 A1	1-4

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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Date of the actual completion of the international search

18 April, 2013 (18.04.13)

Date of mailing of the international search report

07 May, 2013 (07.05.13)

Name and mailing address of the ISA/
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/054590

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 8-324584 A (Kaken Kogyo Kabushiki Kaisha), 10 December 1996 (10.12.1996), paragraphs [0027] to [0051]; fig. 6 to 7, 9 to 11 & CN 1152528 A & GB 2303116 A & HK 1010711 A1 & MY 141902 A & SG 73980 A1 & US 5927336 A	4
A	JP 49-86176 A (Heinz Bildner), 17 August 1974 (17.08.1974), page 2, upper left column, line 11 to lower left column, line 19; all drawings & BE 802964 A1 & DD 105156 A5 & DE 2239237 A1 & FR 2195938 A5 & IT 993706 B & NL 7310772 A	1, 5

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REFERENCES CITED IN THE DESCRIPTION

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- JP 2691881 B [0005]