

EUROPEAN PATENT APPLICATION

Application number: 80303889.2

Int. Cl.³: **B 65 B 17/02**
B 65 D 71/00

Date of filing: 31.10.80

Priority: 01.11.79 GB 7937892
31.07.80 GB 8025126

Date of publication of application:
15.07.81 Bulletin 81/28

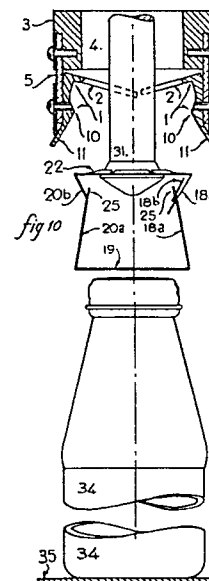
Designated Contracting States:
BE CH DE FR GB IT LI NL

Applicant: Michael F. Joyce trading as INNOVIA Patent Holdings
25 Rangewood Avenue Kennet Valley
Reading Berkshire RG3 3NN(GB)

Inventor: Joyce, Michael Fred
25 Rangewood Avenue Kennet Valley
Reading Berkshire RG3 3NN(GB)

Apparatus and method for the application of holders to bottles, such holder and blank for forming the holder.

The present invention discloses an apparatus and its operation for the application of various forms of a particular holder for bottles (34) also disclosed for the purpose of the application in a new manner comprising elastomeric spring hinges (5) which enable it to be carried into improved effect wherein the holder, the bottle (34) and its supporting substrate (35) perform as a part of the apparatus to form the holder onto the bottles resultant from the vertical operation of the driven part of the apparatus. The apparatus carries at least one elastomeric spring (5) hinged first (1) and second (2) members for first pressing inwardly at least one side of the holder and secondly the Second member or Second members, forming a pressing surface which as a result of the reaction of the bottle shape (for which the holder is especially designed) and the bottle supporting substrate in combination together perform the invention. The invention includes also a special supporting substrate (35) for bottles where their height varies slightly or bottles are presented for application in a semiflexible crate.



TITLE MODIFIED
see front page

IMPROVEMENTS IN APPARATUS AND BLANKS OPERATED IN COMBINATION AND A METHOD FOR PRODUCING HOLDERS FOR CONTAINERS ON A SUBSTRATE OR WITHIN A SEMIFLEXIBLE CRATE.

BACKGROUND OF THE INVENTION.

The present invention relates to improvements in the application of holders to containers to form multipackages by the operation of apparatus in combination with the holders on a substrate or in a crate.

Development work with holders for gripping the top portion of containers

5. such as bottles has shown that such holders can be made with less than 50% of the area of paperboard necessary to hold bottles by early forms of multipackaging which must surround the whole of the bottle body.

Such reduced area holders are able to hold the bottles more firmly and so prevent their sharp contact together. The earlier forms of multipackage

10. are loose because they must be made all the same size and must be applied as a tube by machinery which is only able to wrap it around the containers which because they are variable and slightly elliptical and can move within the tube into an even slacker position. Therefore it is possible for a reduced area multipackage to better protect the glass for the benefit of

15. all concerned and for the bottler to multipackage all the year round for a cost similar to his high seasonal promotions currently multipackaged for many companies.

It is an object of the present invention not only to provide multipackages which are more economic and tight on the container necks to enable the

20. containers to be better seen but to apply them with apparatus including a spring hinge of variable geometry which will enable the apparatus to operate through using the resistance of the erect but unapplied holder to activate the apparatus and control it to produce the desired tight grip of each individual bottle.

25. It is also an object of the present invention to provide blanks for the holder to so operate the apparatus. It is a further object of the invention to provide means for positioning the holder ready for application to containers and for positioning the bottles on a substrate which may be flat or irregular such as for instance, when they are housed in a crate.

BRIEF SUMMARY OF INVENTION. According to the present invention there is provided apparatus mechanically operated in combination with a retained holder for containers operable with the containers on a substrate and having a neck portion reducing toward a downwardly facing rib, the holder

5. comprising a pair of spaced side walls each having upper and lower longitudinally extending edges, an upper wall connecting the upper edges and preventing relative displacement of the upper edges away from each other, a lower wall connecting the lower edges and preventing the relative displacement of the lower edges away from each other, said upper and lower

10. walls having aligned openings therein, the openings in the lower wall being dimensioned to pass freely over the rib portion and engage a wider part of the container and the openings in the upper wall arranged with tabs able to pass over a rib of the container neck or its closure and engage below it, both side walls able to engage below rib parts of the

15. container and a longitudinally extending fold line in at least one of the side walls adapted for engagement with the containers when the containers are disposed between the side walls and when said one side wall is folded inwardly of its upper and lower edges comprised in one such holder or two such holders sharing one blank, by the apparatus; the apparatus

20. comprising at least one spring hinged first member formed for applying pressure to said one side wall and fold it inwardly of its upper and lower edges and caused to fold further inwardly by a second member of the apparatus shaped to simultaneously or subsequently apply pressure to the upper wall or walls until the holder is applied to the containers by the

25. downward operation of the apparatus and holder onto the bottles, the apparatus thereafter disengaging from the holder and containers for reuse in combination with another holder and containers on a substrate arranged to occupy the openings of the holder.

According to a preferred embodiment of the invention the said retained

30. holder is retained below the second member by member means projecting through the second member for engagement of the holder, for instance means larger than the said openings in the upper wall arranged with tabs and able to pass through their resistance for retention on the larger portion of the means until removed by the second member.

35. According to another preferred embodiment of the invention the spring hinge is formed of elastomeric material fixed to a component member and a support member.

According to yet another preferred embodiment the erected holder on containers is disengaged from the apparatus by the inner surface of the closed members formed to allow the apparatus to initially retract before the spring hinge must move to allow further retraction of the apparatus.

- It will be understood that to carry the invention into effect it is an essential that the bottles are supported from below for the reaction to the downward operation of the apparatus and which reactive component of the invention is provided by the said substrate which must provide that
5. the top of the bottles are level whether the bottles are the same in height or slightly vary in height therefore the invention provides that, wherein the bottles are similar in type but having height irregularity, means comprising in an individual support below each bottle, the supports each of similar height and retained vertically by compressable
10. material which compressability may be adjustable, such that when the bottle upper parts are pressed downward for application during the application of holders according to the invention the said pressure applied to cause the bottle upper parts to be level by any irregularity of the bottle height being accommodated by the compressable material
15. below the application of pressure by parts of the apparatus which are level.

BRIEF DESCRIPTION OF DRAWINGS.

- Embodiments of the invention will now be described by way of example, reference being made to the accompanying drawings in which:
20. Fig 1 is a perspective view of apparatus according to the invention.
Fig 2 is a view of the underside of the apparatus shown by Fig 1.
Fig 3 is a sectional view on X - X of the apparatus shown by Fig 2.
Fig 4 is an end view of the apparatus in combination with a holder and containers operating in accordance with the method of the invention.
25. Fig 5 shows fig 4 in a subsequent stage of the operation.
Fig 6 shows an alternative form of half of the apparatus shown by fig 5.
Fig 7 shows another embodiment of the holder according to the invention with apparatus according to the invention shown retracted.
Fig 8 shows a blank for a holder according to the invention.
30. Fig 9 is an end view of the blank shown by fig 8 during erection into a tubular structure for subsequent application.
Fig 10 shows the holder shown by fig 9 in the erected condition and retained ready for application by another part of the apparatus to bottles.
Fig 11 shows the the apparatus and holder shown by fig 10 after cooperating
35. together to apply the holder to bottles.
Fig 12 shows a diagrammatic view of a row of bottles of irregular height with their upper parts level.
Fig 13 shows a diagrammatic view of a row of bottles of irregular height resting on an irregular substrate supporting.
Fig 14 shows a diagrammatic view of a row of bottles in a crate with an

irregular base supporting them, their upper parts level and the method according to the invention supporting them below the crate.

Fig 15 is a section on X - X of Fig 16.

Fig 16 is a plan view of a means for supporting bottles of irregular height.

- Fig 17 is a perspective view of an apparatus for the application of carrier
5. blanks (less the First and Second apparatus members) to bottles when loaded into crates.

Fig 18 shows an embodiment of a part of the invention through three positions on the same drawing centre line.

10.

15.

DETAILED DESCRIPTION OF THE INVENTION.

20. Figures 1, 2 and 3 show an embodiment of the invention in its relaxed condition prior to operation. Like reference figures have like meaning throughout, 3 is a support member actuated by other unspecified means and positioned with the centre of the openings 4 each directly above the centre of a bottle to be held and with the skirt parts 11 open to receive the
25. upper wall 21 of an erected holder between them and guide the side walls 18c and 20b between the crests 10 when the support member 3 is moved in the direction of arrow 13 of Fig 4.

- Figure 4 shows the free ends of the Second Members 2 performing as levers and being deflected by their contact with the upper wall 21 supported by
30. the bottles 32 resulting in the inward movement of the First Members 1 and made practical by the spring hinge of which 5 shows a preferred embodiment seen clamped to the support member 3 and to the First and Second Members 1 and 2. As shown the spring hinge is made of strips of sheet elastomeric material, for example Polychloroprene.
35. The elastomeric spring hinge has several advantages over a mechanical hinge, firstly it has an effective pivot point which moves with the cleft 6 formed between the First and Second Members 1 and 2 and which retains the upper edge of the side wall 7a and 7b in the correct position while

being tollerant of related dimensions, whereas a mechanical hinge with a fixed central pivot would cause clefts 6 to move in an arc and if the cleft position is correct with the pivot in one position it will be wrong when the angle of the First and Second Mebers is changed since the pivot

5. point cannot conveniently be identical with cleft point 6. A second advantage of the elastomeric hinge is that it will spring return to the position shown by Fig 1 without substantially changing its force regardless of surrounding conditions such as dryness through lack of maintenance or stickiness associated with bottled products and which would adversely

10. affect the performance of a mechanical hinge with a metal return spring. A third advantage of the elastomeric return spring hinge is that the spring is inherent and so will not occupy any space whereas a metal spring requires both central space and anchorages at each end which it is less practical to apply to the apparatus required.

15. It has been found to be important for both sides of the holder to receive similar treatment where the holder is designed to be symetrical otherwise one side of the holder will form before the other and further bias the application to produce an asymmetric finished product as seen in end view. Fig 6 shows a prefered development of the present invention where the

20. extension 8 of the double thickness section 9 provides a curve which will cause a rolling action between the First Members 1 and the strips of sheet elastomer 5 which results in the control of the locus of the cleft 6 and the crest 10 on each side resulting in an imaginary pivot point which can be made to coincide with the cleft points 6 and which has proved to be

25. important to the ability of the apparatus in combining with the holders in applying it to containers correctly without slipping to one side or the other. The embodiment shown by Fig 6 also shows an advantage in its construction since the shape shown for the First and Second Members shown by Figs 1 to 5 are very difficult to produce with the necessary dimensional

30. control especially as it must be different for each different holder design which is dictated by the bottle shape but the double section 9 both allows the shaping to be done in two parts and joined by spot welding later and it provides the only thick part necessary since it is required to take screw threads for screws to clamp the elastomeric sheet strip.

35. Figs 1 to 5 show that the Second Member 2 is divided to produce the two activating levers for operating against the upper wall of the holder 21 which will be produced concave when applied to containers and this too is made more practical as shown by Fig 6 through the addition of a moulded resin compound to produce the cooperating convex shape 12. Figs 10 and 11

40. show an ideal shape for the First and Second Members where they are moulded.

One such moulding is produced on an internal former machine wherein the wall panels are represented by four members having one and two flat sides and pivoted at each end on clamps able to move vertically and horizontally such that the inside form can be made up to any such form, while the outer surface is covered by a stiff sheet with plastic covering and appropriate lines of fold adapted to be clamped over the outer surface. Stainless steel inserts are provided at the ends of the Second Member lever end for making active contact and other inserts are provided for the screw threads. If stainless steel inserts are used between the First and Second Members then polyester resin catalized, with glass cloth which is well impregnated is better than epoxy resin catalised, with carbon fibre fillaments. Figure 4 shows that the Second Member (parts) 2 is here divided and operated as two separate levers because the holder in this instance is symmetrical and the two levers thus provided have moved upwards and are higher than the crests 10 of the First Members 1 which have made contact with the side walls 18c and 20b below the upper wall 21, thus the holder itself performs as a major active part of the apparatus as the upper wall moves into the apparatus, while the First Members continue to move further inward to initiate the inward buckling of the side walls 18c and 20b the crests 10 will reach a maximum point beyond which they cannot go due to the geometry necessary to allow the requirement already described. As support member 3 continues down in the direction of arrow 13 the divided Second Members 2 come together to complete the Second Member 2 which will take over from the First Members 1 and be able to exert pressure over the whole of the upper wall 21 and the folds 7a and 7b with folds 26 of the holder take over to combine with the apparatus to apply the force from the Second Member 2, with the holder confined between clefts 6, until it is applied to the bottles as shown by Fig 5. The support member 3 will then retract in the direction of the arrow 14 and because the shape of the holder is changed irretractably the Second Members 2 are held as one so that the First Members 1 cannot move outward to release the holder, therefore the parallel depth 15 of the form of the present invention is included to allow the release of Second Member parts 2 and the dependent First Member parts 1 through the inclination of the spring hinges 5 of the present invention to open rapidly and facilitate fast action. The end views in Figs 4 to 5, 7, 9 to 11 show joined panels forming the holder with their practical proportions and positions for performing according to the invention which extends to the blanks for the purpose of their application to containers as holders. The holder may be erected into a rectangular tube structure by simply

gluing a lap extension 16 of the bottom panel 19 to the related side wall 18a and although the gluing operation is an added expense it is useful in that the means for erecting it are more simple and the supporting machinery is therefore cheaper.

- 5. If the holder is to be erected and applied at higher speed then a more expensive machine can be amortised over a shorter period due to the quantity of holders thus used and saving the gluing operation cost.

Therefore the blank may be arranged such that three or more resultant resistances to forces in different directions are in opposition to make

- 10. them immovable in the normal course of usage. In Fig 5 all members of the applied holder and bottles together are in tension or compression to form a prestressed monocoque construction therefore such directional resistance to movement can be arranged. Fig 7 for instance shows the necks of the end bottles of two rows of bottles with their necks each through a
- 15. lower opening 24 of lower walls 19 joined together therefore there are two separate holders according to the invention each a mirror image of the other and embodied in one blank. Therefore when the longitudinal fold line, said to be in at least one of the sidewalls, 26a was buckled inwardly with 7 under the rib or rim of the bottle and upper wall 21 was
- 20. folded down so that tabs 22 snapped under the bottle rim, so both opposing walls 20a were made tight against the lower walls 19 to make all wall and bottle members captive with the ends of the blank 27a and 27b perpendicular to lower walls 19 to form a panel for a handling hole facility, while extensions 20c interlock with lower wall 19 to maintain the strong
- 25. position and prevent twisting of the tubular structures so formed.

The earlier position of the tubular structures is shown by a chain dot line above one side of the twin holder while above the chain dot form there is shown an embodiment of the apparatus, the comparable members of which can be readily understood from the references. However it shows

- 30. that spring hinge 5 may be positioned such that on being moved down by the support member 3 in the one direction shown by arrow 28 it will result in a lateral force on 7 until resistance is reached whereupon a vertical force will again apply to 7 resulting in a rotary force in the direction of the arrow 9, thus the one vertical force is vectored to comprise other
- 35. useful force components. Only one half of the apparatus is shown in Fig 7.

A similar join is made without gluing in a single row bottle holder blank as shown by Fig 8 and which is erected as shown by Fig 9. The dimensions indicated at (a1) and (a2) and (b) show the repeat lengths where (a1) is an

- 40. end while (a2) being a mirror image of it is the other end and (b) is

equal to one bottle pitch and can be repeated two or three times to hold three or four bottles or as required.

It is notable throughout that any of the blanks for the holders could be cut from board with a die cut forme and with gutters between in the normal

5. way of the trade, it is possible with the blank shown by Fig 8 to have a particular arrangement of the invention wherein the blanks interlock and so economise in board further since no guttering waste is included.

To demonstrate this economy embodiment parts of the surrounding blanks are shown on the left and the bottom so that the repeat arrangement on

10. all sides can be seen.

The walls are arranged with the join made between the lower part of the side wall 18a and the upper part of the side wall 18c and 18b together but in other ways the references are as in previous Figs 4, 5, or 7.

The lower wall 19 has openings 24 which rest on the shoulders of the bottles and which wall is joined by a line of fold to side walls comprising 15. 18a and 18b with 18c, and 20a and 20b joined by a line of fold to upper wall 21 with opening 23 to receive the rim of the bottles and surrounded by tabs 22 with their free end for engaging below the rim of the bottles or other rimmed container for locking the other walls in their place and 20. holding side wall extensions 25 tightly under the bottle rim and from which the superiority of this form of holder is derived.

In the applied condition of the holder shown by Fig 5, wall 18a will resist a force able to move 18b away from its position flat against upper wall 22 while 18b will itself resist a movement away from the resistant 25. bottle and which in turn is held by a similar action of the opposite side. Therefore the components for resisting in three opposing directions is present at the confined corner 26 of Fig 5 and would prevent the escape of any wall if 26 was a line of cut instead of a line of fold, provided that the cut edge of 18a would not slip off the cut edge of 18c and the 30. cut edge of 18c would not slip off the cut edge of 18a. Therefore in the blank shown by Fig 8 wall 18a has extension 18b and wall 18c has extension 18d with the confluence of the extensions at line 26b, the extensions interlocked and preventing the above slipping. Such interlocking also prevents twisting of the tubular structure and which if it had a cut line 35. at 26, would cause the cut edges to slide one over the other.

The side wall extensions 25, as in Figs 4 and 5, reach beyond the locking tabs 22 and engage a rim of the bottle. The locking tabs 22 may engage a rim of the bottle as shown by Fig 11 but will preferably engage a rim of the closure so allowing the upper wall 21 to be higher and which is 40. better because it will allow the wall extensions 25 to be shorter and so

be able to support much heavier loads. The extensions 25 are given much more strength when applied to the bottles because their dependent creases 35a, 35b, and 35c allow the board to bend around the container at that point to provide a stiff corrugation.

5. According to another embodiment of the invention the extensions 18b, which are hinged at fold lines 26b, are provided with subextensions 17 which are cut from the side wall 18a and are therefore on the opposite side of fold lines 26b to the extensions 18b as shown in Fig 8. Fig 9 shows that when extension 18d of 18c is pushed into the slit vacated by subextensions 17 then 17 will be displaced and rotated on its hinge as shown by arrow 30 thus providing a tendency for 18b to find its way between 18c and 21 as seen when erect ready for application in Fig 10 so that it will become trapped when secured to bottles as shown by Fig 11.

The tendency described is important to the apparatus because if 18b were to slip slightly to the other side of perpendicular then it would not deflect into the angle between 18c and 21 and there is no convenient control method for the apparatus to operate inside the holder therefore here again the holder is a part of the apparatus for application of the holder to containers. This is especially important where the holder must be erected in one place and transported to another place for application, such as a row of bottles inside a crate for the apparatus to operate the therein. The holders described are ideal for crated bottles particularly where the crates have separators between the individual bottles.

- Such transport apparatus through retention of the holder is a further feature of the invention, in one embodiment the necks of the bottle are used to retain the holders immediately prior to application but in another embodiment there is provided a probe able to project through openings in the Second Member 2, Fig 10, and which openings it must have because it is shaped to fit to the upper wall 21 through which the bottle closures will project. The probe is therefore central with the final position of a bottle and able to retain an erected holder in that position. The probe carries means able to engage a holder for instance by a head slightly larger than the opening 23 able to penetrate between the free ends of the tabs 22 and so pick up the holder positioned below it and transport it as required. The holder can then be removed onto the bottles and then applied to them by the descent of the Second Member 2, on the support member 3, to collapse 18c, 18b and 21 together, and similarly collapse 20b and 21 together, as in Figs 4 to 5 onto bottle 32 and in Fig 11 onto bottles 34 where the holder is secured without any gluing cost the apparatus will then retract as described for Fig 5.

- It will be understood that such transport means can be used with any supporting machine arrangement for the apparatus and with any form of the blank, however a particularly suitable arrangement for applying holders to crated bottles would include a number of such apparatus for
5. a single application to a full crate of bottles and fixed to act as one, first moving to a position over a group of erected holders by passing them through an erecting tunnel, the apparatus moving down to pick up the holders on the probes 31, the apparatus moving up and on to a position over the centres of the bottles in the crate, then down so that the probe
10. 31 will stop short of the bottles and the Second Members 2 will pull the holder from the probe and continue down to stop with the holders applied to the bottles before returning to repeat the cycle. Additionally a second group of apparatus could make a similar travel such that while the first group of apparatus moves down to pick up holders the other moves
15. down in harness to apply its holder group and while the two groups of apparatus are up the crate is replaced with another crate of bottles without holders, therefore a relatively slow and simple machine could provide a good output due to the quantity of bottles in a crate.
- In addition to the above simple machine for operation in accordance
20. with the invention, another such machine for operation in accordance with the invention will now be described because it shows by way of example the special substrate required where the bottles are of one type but are not the same height due to industrial glassware manufacturing tolerance and where such bottle are returnable and are there-
25. fore from different batches, or made by different manufacturers at different times.
- It will be understood from previous description that the blank when folded into a holder must necessarily be straight with straight longitudinal lines of fold, therefore the bottle's closures and any downwardly facing rim used by the holder must be all in line as the holder
30. is applied, as shown diagrammatically by Fig 12, regardless of any individual bottle height. Such returnable bottles are usually capped by a crown-closure and transported in crates made from plastics material and which is inherently semi-flexible, usually polypropylene.
35. However such crates are themselves very irregular and at their point of support for the bottles which adds to the irregularity of the bottle height. One reason for irregularity of the crate is that they are moulded while hot and on cooling there are internal stresses which show up as distortions upon reheating, for such purpose as washing, this is
40. known as "memory" in the plastics trade.

Also such crates are subject to wear and other forms of distortion. Therefore the irregularity of support for the bottom of the irregular bottles, as diagrammatically shown by Fig 13 make it even more difficult to achieve the situation shown by Fig 12 and which is necessary.

5. Therefore an important part of the present invention is the substrate referred to in claim 1 and which may be substantially flat for the support of disposable bottles made in the same batch of glassware but which substrate may be of special formation and diagrammatically shown by Fig 14. Fig 14, like Figs 12 and 13 are greatly exaggerated since the real deviation, if drawn to scale, would not be discernable. Figure 14 shows the base (A) with spring loaded plungers (I) which are best understood with reference to Figs 15, 16 and 17.
10. Referring to Figs 15, 16 and 17 together, (D) is a slat feed conveyor for carrying crates forward to the substrate which supports the bottles in this way and which I call the Equalising Bed 35 generally, and located for instance in the machine shown by Fig 17 as 35. The Equalising Bed has spring loaded rails (B) on each side to support the crate 36 as they are pushed forward by flights 37 to ensure correct timing. The spring loading of the rail support (C) is only sufficient to carry the filled
15. crate so that rail (B) will collapse when the bottles within the semi-flexible crate 36 are pressed down against the central resisting plungers (G), outer resisting plungers (H) and corner resisting plungers (I). The bottles are pressed downwardly by an embodiment of the invention shown by Fig 18 wherein similar reference letters are used. One difference being
20. that the side skirts 11 of the apparatus are removed and another difference is that flat spring plates 38 are fixed to each side, the plates having a cleft 39 coinciding with each side of the bottle for centering the bottles when the apparatus is in the downward position, see the lower part of Fig 18. However the main difference is that there is an additional level
25. surface 40 for pressing the top of the bottles until the tallest bottle is pressed level because the additional level surface 40 is set to push downwardly until it reaches the lowest bottles normally encountered. Therefore the tallest bottles are displaced downwardly by flexing the semi-flexible crate and the plunger which supports it.
30. The plungers (G), (H) and (I) are shown supported by compression springs (J) which are in turn supported by pressure control thimbles (K) which are held by lock-nuts (L). (N) is a plunger retaining plate. (M) is the light springs for controlling the collapsing side rails (B). (F) is a protective membrane sheet. (E) is a slat conveyor for removing the crate after the holders have been applied to the bottles by them being moved
- 35.

forward again by the flights 37.

Referring to Fig 18, the platen 41 carries the apparatus and only one of the bottle centre lines of action is shown. The probe 31 is spring loaded in the downward direction and it is controlled by it being held upwardly

5. by the platen, excepting that it can only move downwardly to its limit shown at 31C. The sequence of operation is that; the crate of capped bottles moves into position on rails (B) above the Equalising Bed 35 and below the platen 41 which is drawn down as a controlled press action after a row of carrier blanks 42, see Fig 17, has moved under the apparatus and

10. a holder 42 is moved under the apparatus for application as shown by Fig 18.

The platen 41 and the apparatus follow the path of the arrow line "Y" of Fig 18 therefore; the first level is 41A with the probe pick-up end at 31A; the second level has the platen level at 41B and the probe

15. pick-up end at 31B has engaged in the holder opening 23 as previously described; the third position has the platen level again at position 41A and the probe at 31A with the holder on it and shown by the chain dot line as a rectangle, meanwhile the carrier which brought the holder to the position will remove and pick up another load set of holders in rectangular form for the next cycle; the third position is where the platen

20. and its apparatus continues on the move down but where the holder is pulled from the probe at 31C where it stops at the limit of its travel and said pulling is done by the Second Members 2 as previously described; the fourth position has the platen in its lowest position 41D with the surfaces of the

25. apparatus, and referred to as 40, acting as a press for pushing the highest bottle down to the height of the lowest bottle by the highest bottles having depressed the plungers below them and having bent the semi-flexible crate sufficiently to allow the bottle tops to all be pressed flat by the in-line surfaces 40 and the holders to be fixed to the bottles by the

30. combined action, of the apparatus, of the vertical pressure, of the blank holder, of the probe and of the substrate supporting the bottle operating in unison in accordance with the invention.

The present invention provides a marked advance in the state of the art through providing a speedy and efficient apparatus operating in combina-

35. tion with the holders which provide multipackages able to display the bottle body, its content and label while holding them firmly to reduce bottle breakage, while saving both money and raw material resources.

CLAIMS

1. Apparatus mechanically operated in combination with a retained holder for containers operable with the containers on a substrate and having a neck portion reducing toward a downwardly facing rib, the holder comprising a pair of spaced side walls each having upper and lower longitudinally extending edges, an upper wall connecting the upper edges and preventing relative displacement of the upper edges away from each other, a lower wall connecting the lower edges and preventing the relative displacement of the lower edges away from each other, said upper and lower walls having aligned openings therein, the openings in the lower wall being dimensioned to pass freely over the rib portion and engage a wider part of the container and the openings in the upper wall arranged with tabs able to pass over a rib of the container neck or its closure and engage below it, both side walls able to engage below rib parts of the container and a longitudinally extending fold line in at least one of the side walls adapted for engagement with the containers when the containers are disposed between the sidewalls and when said one side wall is folded inwardly of its upper and lower edges comprised in one such holder or two such holders sharing one blank, by the apparatus; the apparatus comprising at least one elastomeric spring hinge hinging said at least one first member formed for applying pressure to said one side wall and fold it inwardly of its upper and lower edges and caused to fold further inward by a second member of the apparatus shaped to simultaneously or subsequently apply pressure to the upper wall or walls until the holder is applied to the containers by the downward operation of the apparatus and holder onto the bottles, the apparatus thereafter disengaging from the holder and containers for reuse in combination with another holder and containers on a substrate, the bottles arranged to occupy the openings of the holder.
- 30.
2. Apparatus operated in combination with a retained holder as claimed in claim 1 or claim 2 wherein the second member comprises a part or parts spring hinged along one longitudinal edge with its free longitudinal edge angled toward the upper wall and making first contact with the upper wall when moved toward it, a first member fixed to the second member part and moved by the second member when it is deflected by the upper wall such that the first member will initiate the inward folding of a side wall,
- 35.

the second wall member becoming effective when its further displacement is prevented whereupon further movement against the upper wall will further fold the side wall and cause the tabs to engage below a rib of the container.

5.

3. Apparatus in operation with a retained holder as claimed in any previous claim wherein the holder is retained below the second member by means projecting through the second member for engagement of the holder, for instance means larger than the said opening in the upper wall arranged with tabs and able to pass through their resistance for retention on the larger portion of the means until removed by the second member.

10.

4. A holder for application in combination with the apparatus and according to claim 1 comprising a pair of spaced side walls each having upper and lower longitudinally extending edges, an upper wall connecting the upper edges and preventing relative displacement of the upper edges away from each other, a lower wall connecting the lower edges and preventing the relative displacement of the lower edges away from each other, opening in the upper and lower walls to allow a part of each container to pass therethrough into the space between the side walls, and a longitudinally extending fold line in at least one of the side walls to allow said one side wall to fold inwardly upon the upper and lower edges of said one side wall being displaced one towards the other to grip each container when disposed between the side walls.

15.

20.

25.

5. A blank for forming the holder according to claim 5 comprising a substantially rectangular piece of foldable material such as, for example, paperboard divided by longitudinally extending fold lines into four panels such that two of the panels which form holder side walls have a third panel therebetween which forms one of the holder upper and lower walls and the third and fourth panels forming the holder upper and lower walls have one of the holder sidewalls therebetween, said upper and lower wall panels having aligned openings therein dimensioned to admit a container part, a further longitudinally extending fold line formed in at least one of the side wall panels intermediate the width thereof which fold line is interrupted by a cut line at locations corresponding to the openings, and means on one longitudinal edge of the blank adapted for attachment to the other longitudinal edge of the blank.

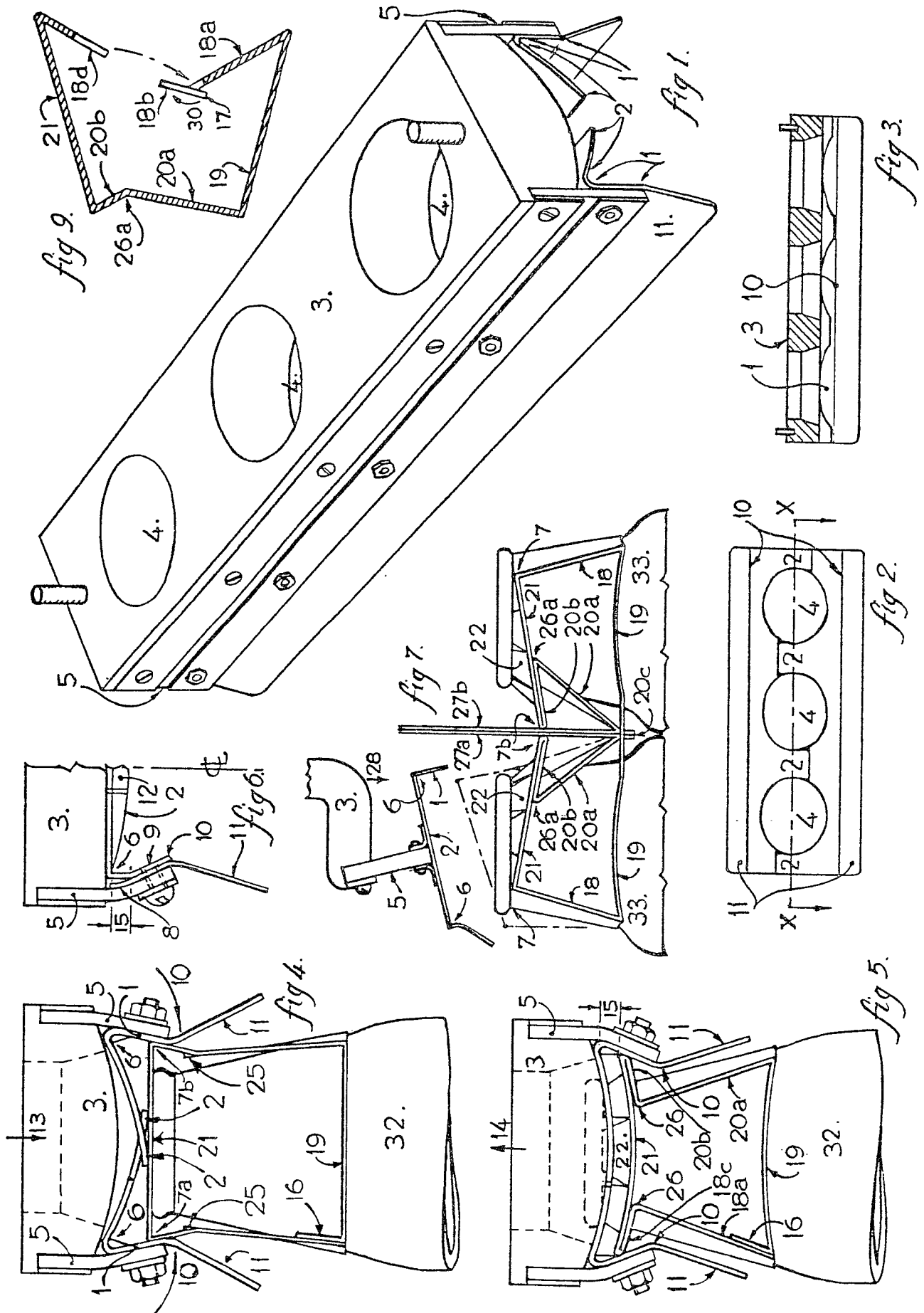
30.

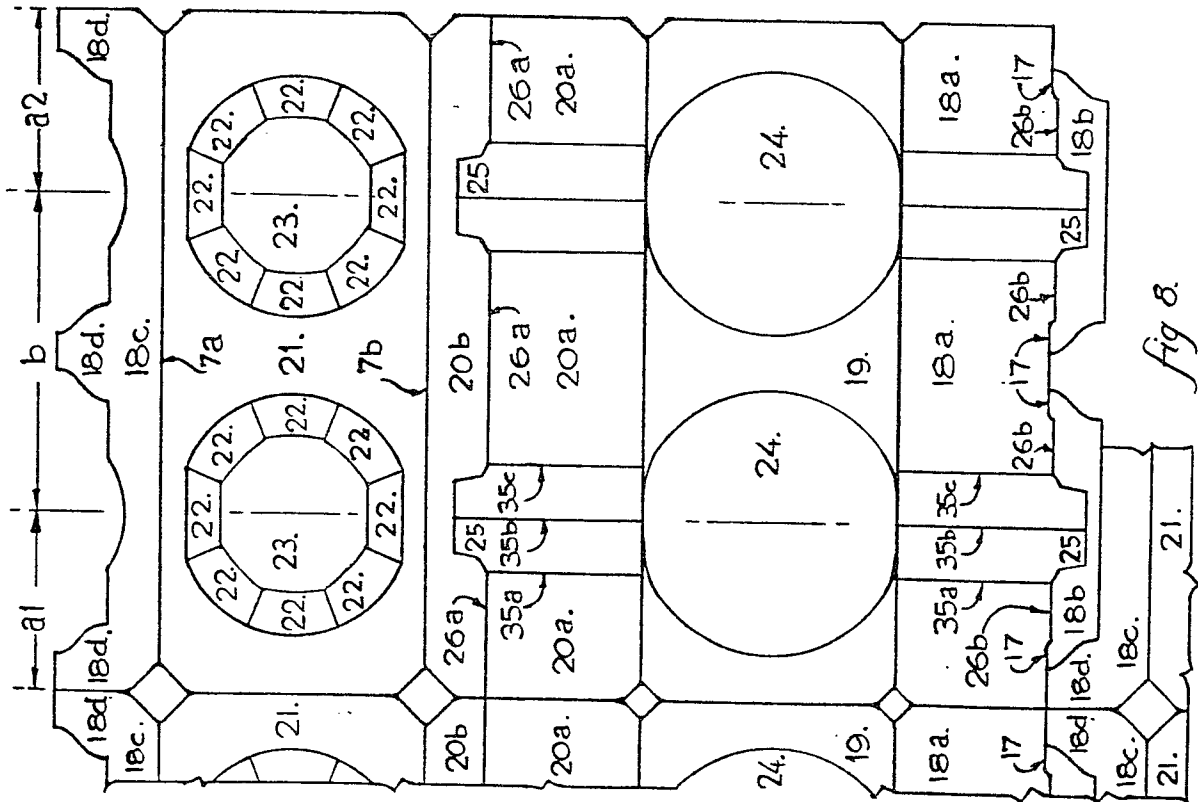
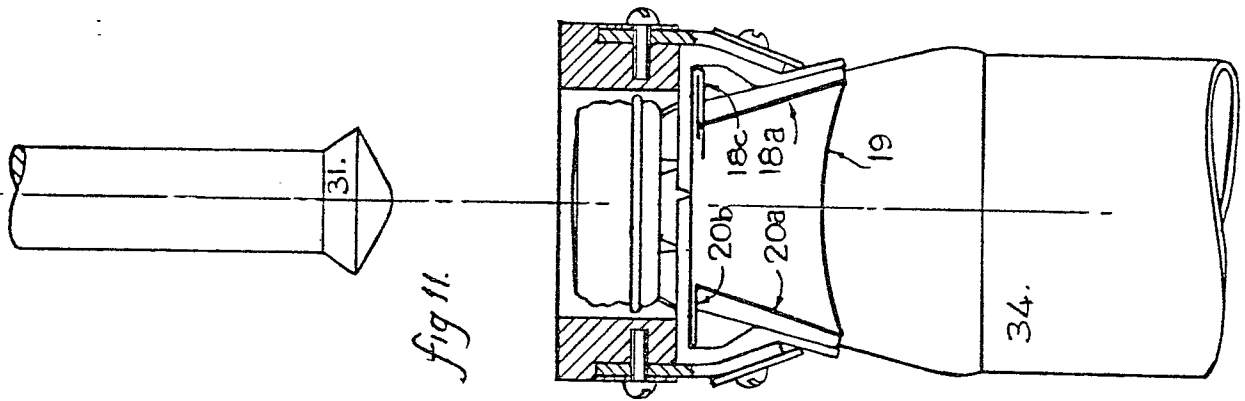
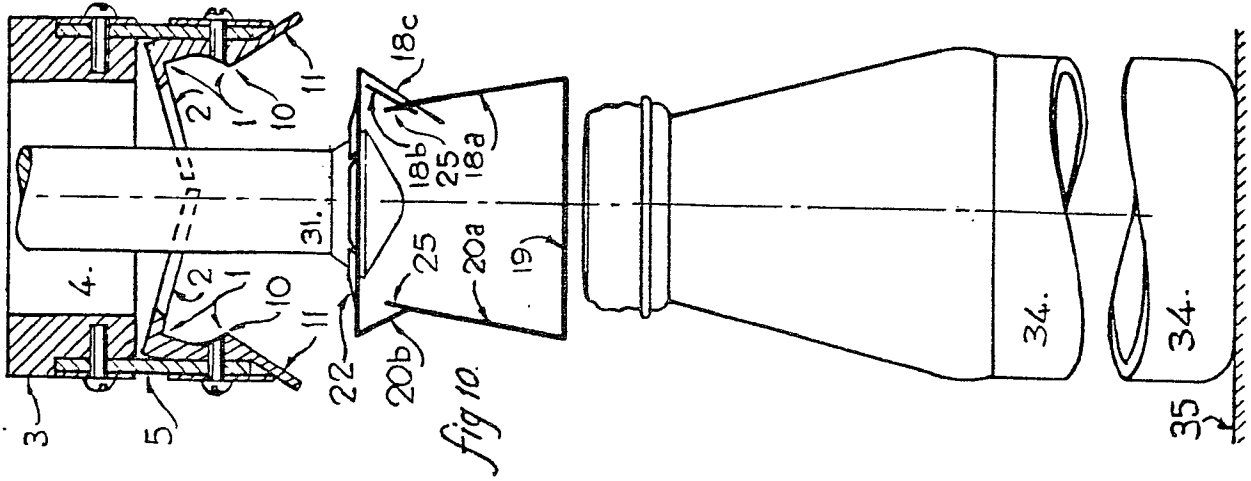
35.

6. A blank according to claim 5 and application for Europatent No 78300117.5 wherein, either alone or continuous with another similar blank erectable into a closed four wall structure without adhesive, the said attachment of one longitudinal edge of the blank to the other is a join imposed upon a confined
5. angle of the holder when applied to containers, the join made between laterally interlockable tongue extensions of wall parts and provided to be arranged each angled one to the other when considered in edge view with the outside of their confluence engaging with a receptive abutment part of the holder blank or the blank in co-operation with a part of the containers when the said one
10. side wall is caused to fold inwardly upon the upper and lower edges of said one side wall by the upper and lower edges being displaced one toward the other in combination with the apparatus characterised in that, the said tongue extensions of the lower wall part below the said further longitudinally extending fold line have a subextension cut from the lower
15. wall and the main tongue extensions divided from the lower wall part by the longitudinally extending fold, the free end of the main tongue extensions arranged to interlock with fixed extensions of the remainder of the same side wall which upon engagement with the subextensions will turn the free extension to lie against the higher part of the side wall, such that in
20. combination with the apparatus the free extensions will become trapped between the fold of the higher part of the side wall and the upper wall.
7. Apparatus in combination with a retained holder for containers as claimed in any preceeding claim wherein the erected holder on containers
25. is disengaged from the apparatus by the inner surface of the closed members formed to allow the apparatus to initially retract from the erected holder before the spring hinge must move to allow further retraction of the apparatus.
30. 8 . Apparatus as claimed in any preceeding claim wherein the spring hinge is fixed to the first or second member in such a manner to the support member that force action of the support member will result in a vectored force action of the first and second members.
35. 9. Apparatus as claimed in any preceeding claim wherein spring members depending from each side of the apparatus will engage the upper part of the container for centering the container below the apparatus, said springs deflecting during application of the holder by the apparatus.

10. Apparatus as claimed in any preceding claim and wherein the said substrate is provided by means comprising in an individual support below each container, the supports each of similar height and retained vertically by compressable material and which compressability may be adjustable, such that when the container upper parts are pressed downward for application during the application of holders according to the invention the said pressure applied is able to cause the container upper parts to be level by any irregularity of the container height, for instance returnable bottles filled, closed and loaded into crates, being accommodated by the compressable material below the application of pressure by parts of the apparatus which are all level.

1/5





3/5

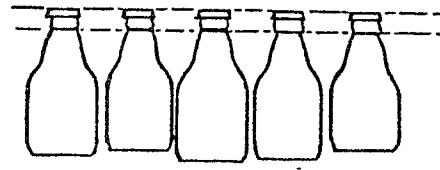
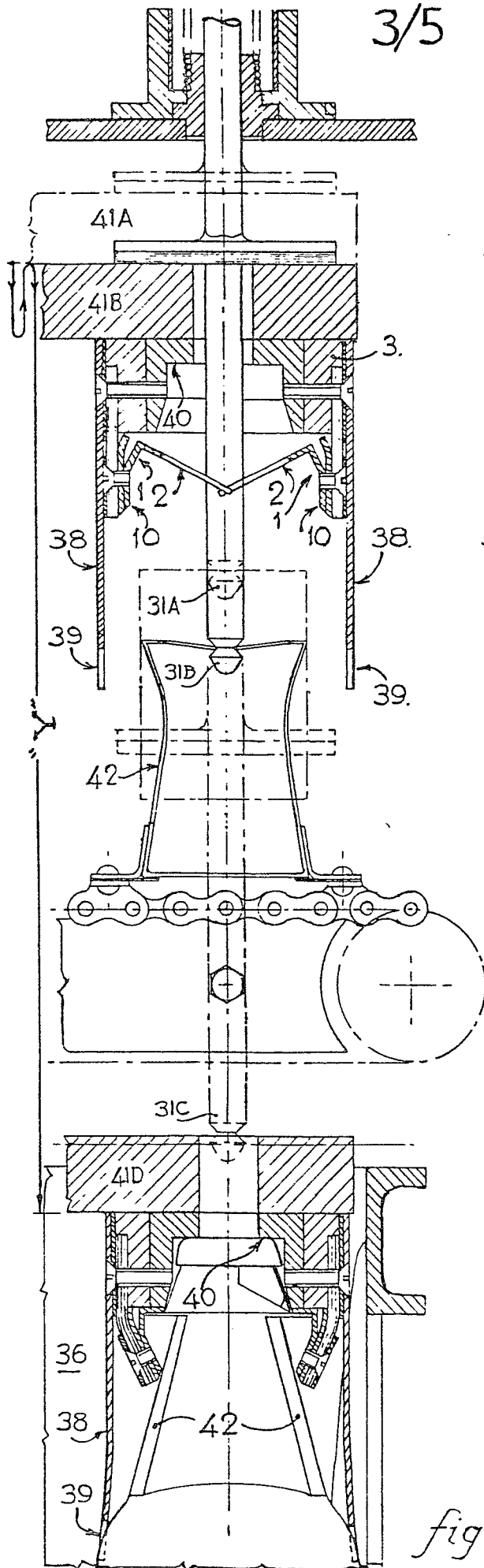


fig 12.

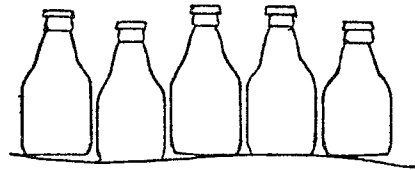


fig 13.

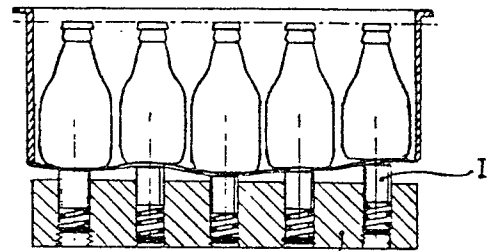


fig 14.

fig 18.

4/5

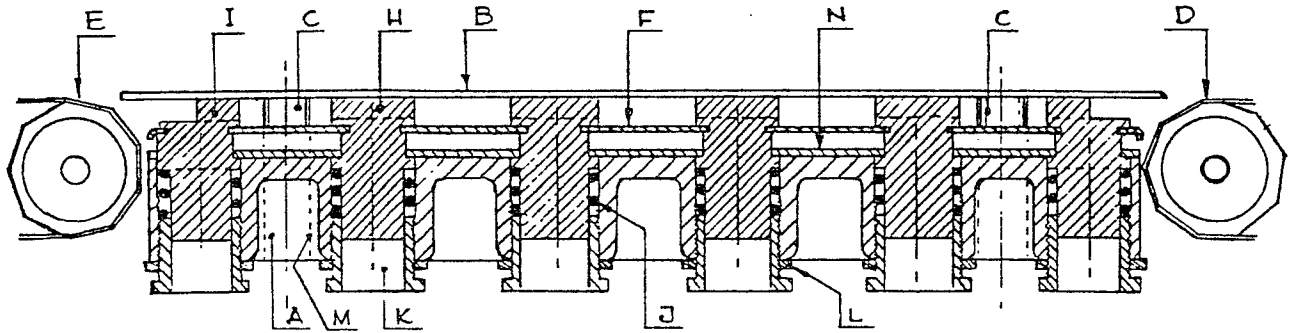


fig 15.

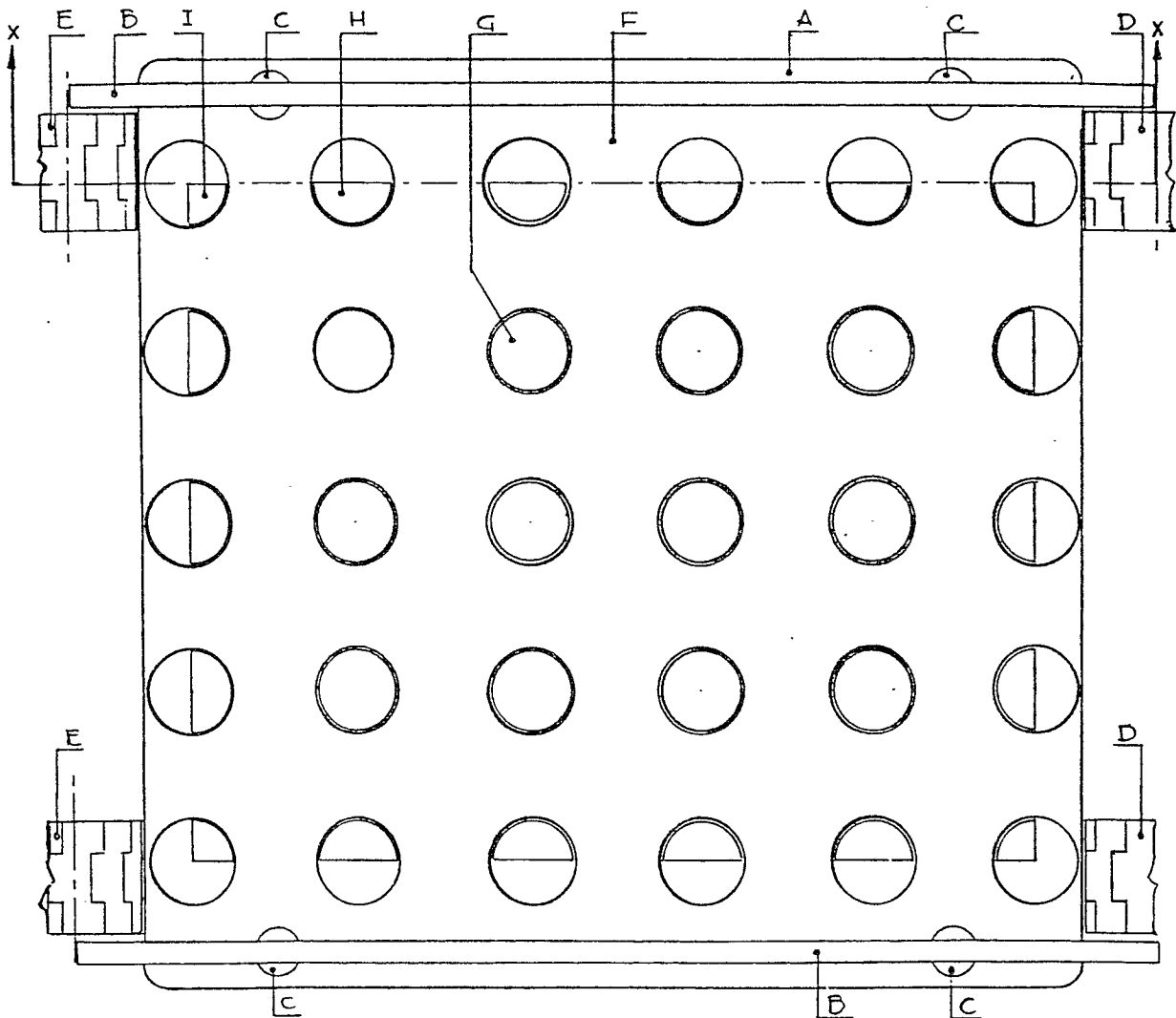
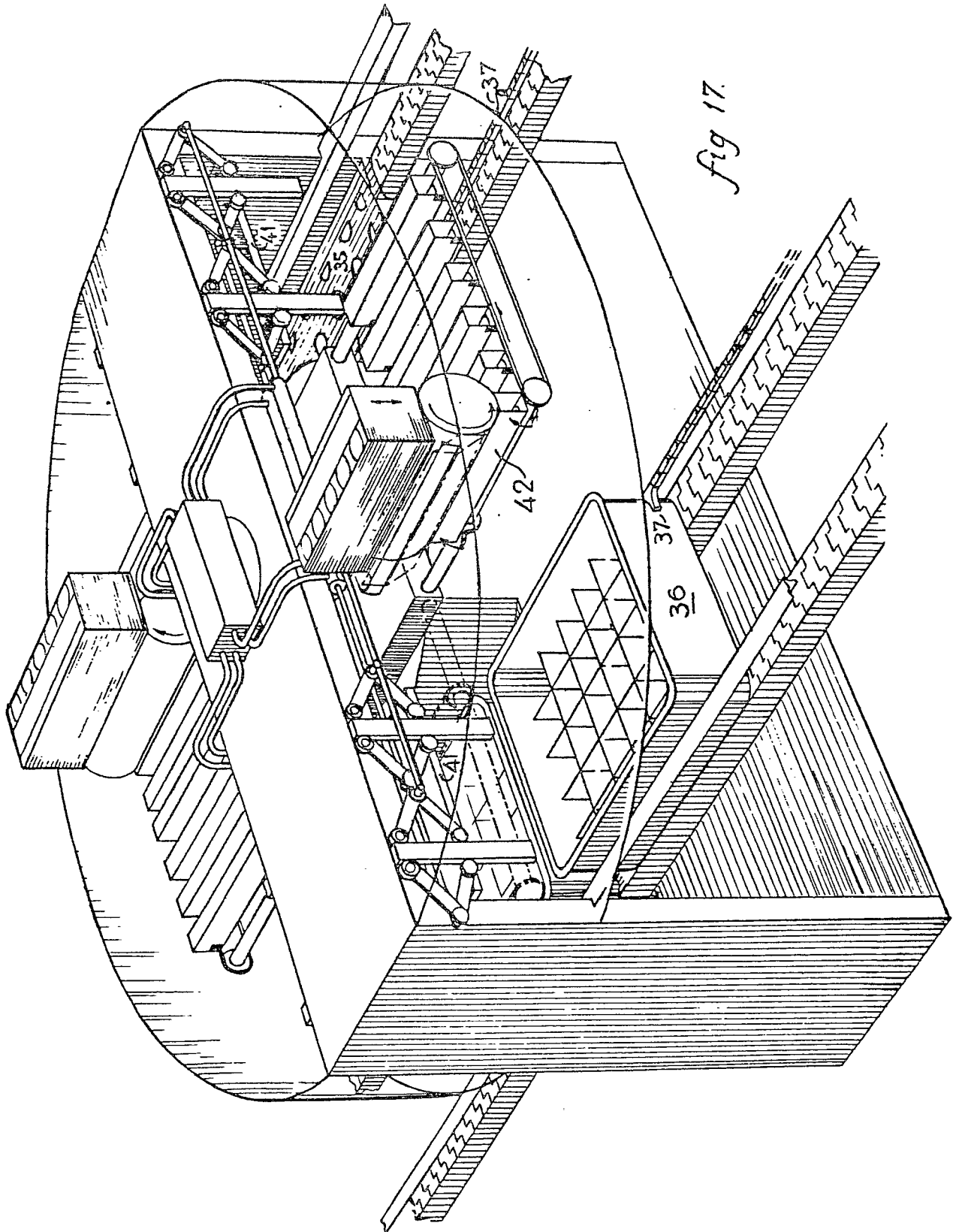


fig 16.





DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>GB - A - 1 395 723</u> (GAUNTLETT) + Totality + --	1,4,5	B 65 B 17/02 B 65 D 71/00
A	<u>US - A - 3 387 879</u> (MEAD CORP.) + Totality + --		
A	<u>US - A - 3 528 697</u> (MEAD CORP.) + Totality + --		
A	<u>GB - A - 926 826</u> (CONTINENTAL CAN) + Totality + --		TECHNICAL FIELDS SEARCHED (Int.Cl. 3) B 65 B 5/00 B 65 B 17/00 B 65 B 21/00 B 65 D 71/00
A	<u>DE - A - 1 808 525</u> (HAUSER) + Totality + ----		
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family. corresponding document
X	The present search report has been drawn up for all claims		
Place of search VIENNA		Date of completion of the search 20-01-1981	Examiner JANC