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(71) Applicant: **Joyce, Michael Fred**
25 Rangewood Avenue Kennet Valley Reading
RG3 3NN, Berkshire. (GB)

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

(54) Carriers for containers, apparatus and method for applying same to containers.

(57) Carriers for containers, apparatus and method for applying the same to containers, such as bottles (B), and made from such material as paper board formed to operate as levers able to withstand tension and compression and arranged as a four-sided tube either singly or with another alongside it and connected. Openings (10 and 14) in the top and bottom of the tube to admit each container, at least one side wall (4a, 4b or 6a, 6b) deformable inwardly along a line to grip each container and such side wall above and below the line of deformation stressed compressively.

The joint (15) forming the paperboard into a tube utilises the compressive force and the stiffness locked into such side walls and which form the ends of the blank, by arranging them as force components at an angle and in opposition one to the other and their resultant force resisted, by a relatively immovable and receptive part of the carrier with containers holding the confluence of the side walls captive, thereby making the ends of the blank secure in a radial plain. The ends of the blank are further secured axially by providing the ends of both such side walls with interlocking tongue extensions (21 and 22) so that an effective joint is made in total.

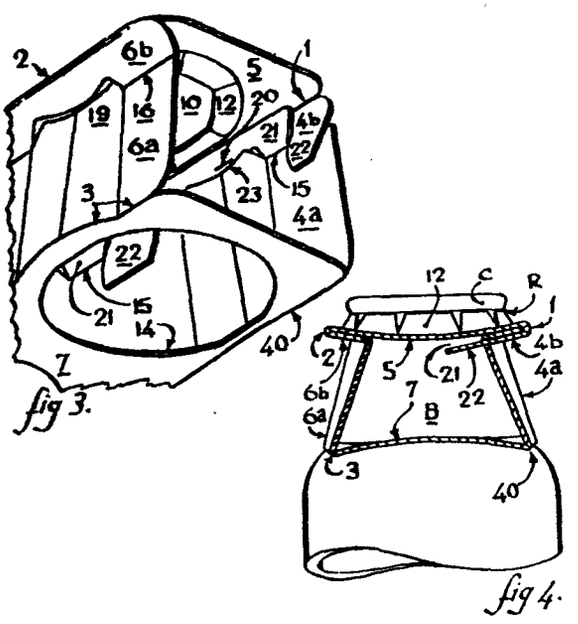

fig 3.

fig 4.

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Improvements in Carriers for Containers

TITLE MODIFIED
see front page

BACKGROUND OF THE INVENTION

The invention relates to multipackaging whereby containers are grouped into readily saleable quantities and fixed into a carrier to facilitate handling and carrying by the end purchaser.

Previously carriers for bottles and cans were made to surround the total group of containers with a sheet of paper board and join the ends without gluing to form a sleeve but this requires a lot of paperboard and is both wasteful of world resources and it generates waste to be disposed of. Also the inconsistency and ovality inherent in glass container making means that the sleeve must be long enough to surround the largest dimensions possible for a group therefore when the bottles are smaller or move around in the sleeve to present a narrower dimension within the sleeve then the total multipackage is loose when offered for sale. Therefore the carrier described by British Patent No 1 395 723, French Patent No 2 155 506, United States Patent No 3 834 750 and others, provided a considerable saving of board area approximating to 30% when used for 10 fl oz (275 ml), 50% when used for $\frac{1}{2}$ litre bottles and more for 25 fl oz (71 cl) and 1 litre bottles when comparing packs where the containers are grouped in line, which saving is more than the cost of gluing the blank disclosed for holding bottles by the neck portion only. According to the disclosure each individual bottle is held by the neck portion by a mechanical toggle lever action, the dimensions of the bottle being more consistent in that portion and the action being effected by the paper board being used in a manner such that its compressive members are stiff and its tensile members have the natural tensile strength of strong paper board, and therefore 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 a rib portion of the neck and engage a wider part of the bottle and the openings in the upper wall arranged with tabs able to pass over a rib of the bottle neck or its closure and engage below said rib, both side walls able to engage below ribs of the container and a longitudinally extending fold in at least one of the side walls adapted for engagement with the containers when said one side wall is folded

inwardly, whereby said one 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 to engage below ribs of the containers when disposed between the side walls.

Apparatus, according to British Patent No 1 427 510, for applying to containers the carrier according to British Patent No 1 395 723 and comprising a pressure surface shaped to conform to the carrier upper wall and provided with apertures to admit a part of any container projecting above said upper wall, and at least one other surface situated parallel to one of the longitudinal edges of the pressure surface and able to contact a side wall of the carrier to fold it inwardly upon its upper and lower edges either simultaneously or previously to the pressure surface pressing the upper wall downwardly until the carrier is applied to the containers.

Refering to the carrier according to British Patent No 1 395 723, French Patent No 2 155 506, United States Patent No 3 834 750 and others the same carrier for a double row of containers was also disclosed wherein one paper board blank is shared by two such carriers. However whereas all of the carriers disclosed have the advantage that its natural folds allow its tubular structure to fold flat for transport (while similar prior art such as British Patent No 902 462 require an additional fold in order to fold flat) there is the disadvantage that the said upper and lower walls must have the same width where both side walls have a longitudinal fold allowing the toggle lever action to take place on both sides of the neck therefore, as both upper and lower walls must be narrower than the bottle diameter, only one of these walls can be continued from one bottle row to the other alongside, so it can act as a hinge allowing the rows of bottles to strike against each other. Similarly where only one side wall has a longitudinal fold the dimensions can be arranged such that the walls can fold flat after gluing but the arrangement is dictated by the proportions of the bottle and it is not possible for both lower walls to meet and the upper walls to meet.

It is an object of the present invention to provide a neck holding carrier with toggle lever action for its grip and which requires no glued join so allowing it to be supplied as a flat blank with greater freedom for design which allows a carrier for a double row of containers to be made wherein the bottom walls are connected and the upper walls can contact and which was not allowed by the previously disclosed blank with co-operating ends which could only be secured by two force components.

BRIEF SUMMARY OF INVENTION

The improvement in such carriers for containers allowed by using a Blank according to the invention supplied flat to a machine which includes Apparatus according to the invention for first erecting the blank into a temporary tubelike structure and then securing it into a tubelike structure on the bottle necks by a Method according to the invention:- Utilising the compressive force and the stiffness locked into such side walls (according to British Patent No 1 395 723 and others) and which form ends of the blank, by arranging them as force components at an angle and in opposition one to the other and their resultant force meeting a third component which is resistive and provided by a relatively immovable and receptive part of the carrier with the containers in it so that the confluence of the side walls is captive, thereby making the ends of the blank secure in a radial plain. The ends of the blank are further secured axially by providing the ends of both such side walls with interlocking tongue extensions so that an effective join is made in total.

Accordingly the invention provides a carrier according to British Patent No 1 395 723, French Patent No 2 155 506 United States Patent No 3 834 750 and others, characterised in that imposed upon a said connection or fold of one such carrier or between two such carriers sharing one blank there is a join for the walls formed into the four-walled structure made between interlocking tongue extensions said extensions projecting from the walls on each side of the join, secured by the walls angled one to the other their outside confluence engaging within a receptive abutment part of the carrier or the carrier and containers when the said one side wall is caused to fold inwardly upon the upper and lower edges of said one side wall by the said upper and lower edges being displaced one toward the other.

Therefore the invention provides a blank for a carrier of sheet material, such as for instance paper board, according to British Patent No 1 395 723, French Patent No 2 155 506, United States Patent No 3 834 750 and others, characterised in that either alone or continuous with another similar blank erectable into a closed four-walled structure, the said attachability of one longitudinal edge of the blank to the other is a join imposed upon a said connection or fold and made between laterally interlockable tongue extensions of side wall parts, the side wall parts provided to be formed at an angle one to the other when considered in a transverse

plain with their outside confluence engaging with a receptive abutment part of the carrier blank or the carrier blank in co-operation with a part of the containers when the said one side wall is caused to fold inwardly upon the upper and lower edges of said one side wall by the said upper and lower edges being displaced one toward the other.

Also the invention provides apparatus according to British Patent No 1 427 510 for applying the blank to containers and characterised by a carrier blank made according to the invention prepared previously, it being erected from flat condition by drawing between forming means or drawing around forming means able to plough-fold the blank at its prescribed fold lines which divide the blank into connected walls thereby the tongue extensions projecting from side wall ends of the blank for interlocking angled to allow the admission of the tongues into their interlocked position the tongues urged together by means moving relative to the carrier to interlock the tongue extensions to form a four-walled temporary structure or two four-walled temporary structures connected.

Therefore the invention extends to a process method for application of the blank made according to the invention wherein the flat blank is folded at prescribed lines to form one or two four-walled tubular structures each having two side walls and an upper and lower wall, the longitudinal ends of the blank with tongues adapted to interlock, and projecting from side wall parts, angled to allow the admission of the tongues into their interlocked position and moved together to interlock, the four-walled structure or structures formed substantially rectangular at the bottom part, the necks of the containers through openings in the lower wall, an upper edge of any side wall not required to fold inwardly engaged below a downwardly facing rib of the containers, the one side wall or both side walls of each structure previously folded inwardly upon its upper and lower edges the upper wall or walls moved downward to displace inwardly at least one side wall of each structure, the lower wall openings engaging a wide part of the bottle necks, the upper wall openings surrounding parts of the bottle necks or their closures, the upper wall locked with the side walls engaging the bottle necks or their closures.

Where required an edge of such tongues, or an edge of a tongue cut within the tongues, and interrupting the line of fold of the said one side wall, may be adapted to engage the containers.

Where apropriate tongues may be enclosed between a part of the side wall and the upper wall.

BRIEF DESCRIPTION OF DRAWINGS

Embodiments of the invention will now be described by way of example, reference being made to the acoompanying drawings in which:

Fig 1 is a plan view of a blank for a carrier according to the invention for a single row of bottles and divided by a broken line arrowed to show the line of section shown by fig 4 and 66% of the scale of fig 4.

Fig 2 is a sectional view in end elevation of the blank of fig 1 being erected into a temporary four-walled structure by apparatus according to the invention and 66% of the scale of fig 4.

Fig 3 is a perspective view of the blank shown by fig 1 after it has been erected into a temporary four-walled structure.

Fig 4 is a sectional view in end elevation of the blank shown in fig 1 secured to the bottles to form a carrier.

Fig 5 is a plan view of a blank for a carrier according to the invention for a double row of bottles shown by fig 7 and 40% of the scale of fig 7.

Fig 6 is a sectional view in end elevation of the blank of fig 5 being erected into a temporary four-walled structure by apparatus according to the invention and 80% of the scale of fig 7.

Fig 7 is an end elevation of the blank shown by fig 5 secured to a double row of bottles, one row in section to the centre line of a bottle. It additionally shows side support, the position of the blank prior to application and apparatus embodying the method for its application.

DETAILED DESCRIPTION OF THE INVENTION

The embodiment illustrated in figs 1 to 4 is a carrier intended to carry a single row of bottles. The blank shown by fig 1 is for three bottles so that the blank formation for one bottle is repeated three times and is a substantially rectangular piece of foldable sheet material such as, for example, paperboard divided by longitudinally extending fold lines 1, 2, 3 and 40 into four panels 4a and 4b, 5, 6a and 6b, and 7. The panels 4a and 4b represent one side wall and 6a and 6b represent a second side wall and 4a has panel 7 between it and panel 6a and 6b, 7 represents the carrier lower wall. The fourth panel 5 represents the carrier upper wall and is joined to the upper edge of the side wall part 4b by a line of fold, its other longitudinal edge carries tongue extensions 22 able to

interlock at openings 24 between tongue extensions 21 projecting from wall 4a to form a temporary four-walled closed structure fig 2. Fig 2 shows apparatus wherein the blank is drawn along by flight 50 between folding bars and around a former 53 which allow folding bars 54 to raise panel 4a and bend tongues 21 backward upon fold lines 15 and upon cut lines 18. The cut lines 18 are important as they not only define an edge 23 for later engaging the bottles they also prevent the return of 21 after being bent backward due to the tightness inherent in die cutting Therefore the bar 54 is curved to fold 4a in the direction of its related arrow fig 2, with 21 bent backward and tongues 22,bent forward upon fold 1, to enter at cut edge 24 by folding bar 55 curved to meet wall 5 which on meeting its curve will fold over, in the direction of its related arrow fig 2, with tongues 22 behind guide 56 to enter tongues 22 between tongues 21 at cut edge 24 to form a temporary closed structure as shown by fig 3. The structure is then placed over the necks of the bottles to be held and the fold 16 is held inward in relation to folds 2 and 3, and folds 15 are held inward in relation to folds 1 and 40, and with tongue 21 making an inside angle of less than 90° with wall 5 as fig 3, the wall 5 is moved downward to displace 15 and 16 inwardly such that tongue 19 will engage below rim "R" of the bottles "B" fig 3 and upper wall 5 will lie against side wall part 6b with openings 14 seated on the shoulder of the bottles. Also edge 23 associated with tongue 21 will engage below rim "R" on the other side of the bottle "B" while 15a of 4b will engage with the outside of 15 of tongue 21 and preferably its outer edge 1b will engage the inside of fold 1, therefore upper wall 5 and side wall 4b will enclose tongues 21 between them. The tabs 12 will also engage below rim "R" to lock upper wall 5 in position and so maintain the toggle lever locking action of lever walls 4b and 6b. Thus 4b and 6b are in compression, as are the remainder of the side walls 4a and 6a, therefore as it would mean these walls being compressed a great deal more if they were to return to their in-line position and they are prevented from moving further inward, to relieve their stress, due to the bottle neck and upper wall being unable to move, the structure must remain secured, as fig 4.

It is relevant at this stage to understand the integers comprising the join. Firstly if the interlocking part of the tongues could be cut away after the carrier structure is secured to bottles it would not open or become slack, however it would be possible to twist it because a twisting

action on a tube with a longitudinal cut will cause the edges of the cut to move one against the other therefore conversely the said interlock of tongues fitting tightly will prevent twisting, they also serve to retain the form of the temporary structure as fig 3. The join attachment is imposed on a longitudinal hinge line which is necessary to the normal working of the carrier such as a fold within the side wall or a fold connecting one wall to another and the final security of the join is due to the compressive stress experienced by the side walls on each side of the join being angled together to exert, at their confluence, a combined force component which is resisted by a part of the carrier or in the embodiment described, by the underside of the upper wall 5 and the neck of the bottles against which 4a is pressing and which together provide an equal and opposite reaction to complete a situation which could be represented by a triangle of forces.

The blank shown by fig 5 offers a similar situation adapted for a twin row of bottles and wherein like reference figures have like meaning. Therefore the part of the blank between each fold 3 is a mirror image (excepting for 26 and 25) each side of the central broken line above which tongues 21 and 23 will meet to form the join. Fig 6 shows apparatus according to the invention and the blank of fig 5 being drawn along by flights 50 between folding bars 52 and around a former 53 which allows folding bar 57 to raise and fold panel (6a left hand) over to break its prescribed crease (3 left hand) in doing so and hold panel 21 against 53 with the cut edge 24 open to receive parts 23 associated with tongue 22 and for entering cut opening 24. Panel (6a right hand) is folded over former 53 by folding bar 58 without breaking the prescribed crease (3 right hand) and which is guided by folding bar 59 to lay tongue 22 over tongue 21, the action of the blank meeting curved folding bar 60 will then move the blank in accordance with its related arrow and cut edge 23 through cut edge 24 to form a double blank into a temporary closed tubular structure. Fig 7 shows the blank of fig 5 in broken lines indicated with broken line arrows 5, 6b, 6a and in full lines 4 and 7 wherein it has been further ploughed into shape and while retained by guide rails has moved relative to the bottles "B" whereby the side walls 4 have clipped under downwardly facing ribs "R" to retain walls 4 temporarily. Rollers 62 of the vertically moving (shown by white arrows) head of the apparatus will then move down to hold the upper edges of walls 4 slightly clear of the engaging ribs "R" so that folds 1 are

free to move inward when pressure surface 64 is moved downward from head 63 (and shown by the black broad arrow). The bar 65 plays an important part because it both holds the three layers of board 22, 21 and 7 together down against the shoulders of the bottles, it also holds the folds (6 right and left) further apart than folds (2 right and left) and folds (3 right and left), it also holds cut edges (23 right and left) in contact with the bottles "B" to maintain the position of folds (3 right and left). The bar 65 is itself held by one end only so that the carrier when secured to bottles can pass off the end of it. Therefore the pressure surface 64 will press the upper walls 5 downward so that the walls 6a will buckle toward the bottles and walls 6b will lie against the underside of walls 5 and remain there with tabs 12 locked beneath the downwardly facing rib "R". The leverage of walls 6b and 5 right and left) will stretch the upper edge of walls 4 tightly around "B" beneath "R" for a better hold. It will be understood that effectively any head apparatus able to ease the movement of folds 1 inwardly and the upper walls 5 downwardly after one fold 16 in each side structure has been displaced inwardly (relative to each side structure) upon its upper and lower edges 2 and 3 respectively, will conform with the invention.

It will be understood from the examples of embodiment given that many other embodiments of the invention can be useful to the many different designs of this type of structure for economic and design advantage.

Michael F.Joyce.

CLAIMS:

1. A carrier for containers such as bottles (B) with a neck portion having a downwardly facing rib (R) of the bottle neck or its closure (C) and a wider part of the bottle below, said carrier according to British Patent N° 1 395 723 French Patent N° 2 155 506 United States Patent N° 3 834 750 and others, comprising a pair of spaced side walls (4 and 6a/6b or 4a/4b and 6a/6b) each having upper (2 or 1) and lower (3 or 40) longitudinally extending edges, an upper wall (5) connecting the upper edges and preventing relative displacement of the upper edges away from each other, a lower wall (7) 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 (14) being dimensioned to pass freely over the rib portion and engage a wider part of the bottle and the openings in the upper wall (10) arranged with tabs (12) able to pass over a rib of the bottle neck or its closure and engage below it, both side walls able to engage below ribs of the containers and a longitudinally extending fold line (15 or 16) in at least one of the side walls adapted for engagement with the containers when said one side wall is folded inwardly, whereby said one 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 to engage below ribs of the containers when disposed between the side walls,
characterised in that
imposed upon a said connection (3) or fold (15) of one such carrier (fig 4) or between two such carriers (fig 7) sharing one blank (fig 5) there is a join for the walls formed into the four-walled structure (fig 3 or fig 7) made between interlocking tongue extensions (21 and 22) said extensions projecting from the walls (6a to 6a or 4a to 4b) on each side of the join (3 or 15), secured by the walls angled one to the other their outside confluence engaging within a receptive abutment part of the carrier or the carrier and containers (7 and B or 5 and B) when the said one side wall (6a/6b or 4a/4b) is caused to fold inwardly upon the upper (1 or 2) and lower (3 or 40) edges of said one side wall by the said upper and lower edges being displaced one toward the other.

2. A carrier according to claim 1 wherein interlocking tongues (21 and 22) are adapted to include means (23) for engaging with a part of the container (B).

3. A carrier according to claim 1 or claim 2 wherein the interlocking tongues (21) extending from one of the walls (4a) are enclosed between a part of the said one side wall (4b) and the upper wall (5) when the said upper (1) and lower (40) edges of said one side wall are displaced one toward the other.

4. A carrier according to claim 1 constructed, arranged and adapted to operate substantially as herein described with reference to figs 1 to 4 and figs 5 to 7 of the accompanying drawings.

5. A blank for forming the carrier as claimed in claim 1 the blank comprising a substantially rectangular piece of foldable material such as, for example, paper board divided by longitudinally extending fold lines into four panels such that two of the panels which form carrier side walls have a third panel therebetween which forms one of the carrier upper and lower walls (5 or 7) and the third and fourth panels forming the carrier upper and lower walls have one of the carrier side walls (4 and 6a/6b or 4a/4b and 6a/6b) therebetween, said upper and lower wall panels having aligned openings (10 and 14) therein dimensioned to admit a container (B) part, a further longitudinally extending fold line (16 or 15 and 16) formed in at least one of the side wall panels (6a/6b or 4a/4b and 6a/6b) intermediate the width thereof which fold line is interrupted by a cut line (19) at locations corresponding to the openings (10 and 14), and means on one longitudinal edge of the blank (fig 1 and fig 5) attachable (*) to the other longitudinal edge of the blank,
characterised in that
either alone (fig 1) or continuous with another similar blank (fig 5) erectable into a closed four-walled structure (fig 5= fig 7, fig 1= fig 3), the said attachability (*) of one longitudinal edge of the blank (fig 5 or fig 1) to the other is a join imposed upon a said connection (3) or fold (15) and made between laterally interlockable tongue extensions (21 and 22) of side wall parts (6a and 6a or 4a and

4b) provided to be formed at an angle one to the other when con... in a transverse plain (fig 7 or fig 4) with their outside conflue... engaging with a receptive abutment part of the carrier (7 or 5) h... or the carrier blank in co-operation with a part of the container when the said one side wall (6a/6b or 4a/4b and 6a/6b) is caused t fold inwardly upon the said upper (2 or 1) and lower (3 or 40) edges of said one side wall by the said upper and lower edges being displaced one toward the other (fig 7 or fig 4).

6. A blank according to claim 5 wherein interlocking tongues (21 and 22) are adapted to include means (23) for engaging with a part of the container (B).

7. A blank according to claim 5 constructed substantially as herein described with reference to fig 1 and fig 5 of the accompanying drawings.

8. Apparatus according to British Patent N° 1 427 510 for applying t... containers the carrier as claimed in claim 1 and comprising a press... surface shaped to conform to the carrier upper wall (5 of figs 7 or 4) and provided with apertures to admit a part of any container projecting above said upper wall, and at least one other surface situated parallel to one of the longitudinal edges of the pressure surface and able to contact a side wall (6a/6b or 6a/6b and 4a/4b) of the carrier to fold it inwardly upon its upper and lower edges either simultaneously or previously to the pressure surface (i.e. 64) pressing the upper wall downwardly until the carrier is applied to the containers, characterised by
a carrier blank made according to the invention prepared previously, it being erected from flat condition (fig 5 fig 1) by drawing between forming means (52, 54 to 60) or drawing around forming means (53) able to plough-fold the blank at its prescribed fold lines (i.e. 1,2,3,40) which divide the blank into connected walls thereby the tongue extensions (21 and 22) projecting from side wall ends (6a and 6a or 4a and 4b) of the blank for interlocking angled to allow the admission of the tongues into their interlocked position (fig 6 or fig 2) the tongues urged together by means (60 or 55) moving relative to the carrier to interlock the tongue extensions to form a four-walled temporary

structure (fig 3) or two four-walled temporary structures connected (fig 7 as broken lines).

9. Apparatus according to claim 8 constructed, arranged or adapted to operate substantially as herein described with reference to figs 6, 7 or fig 2.

10. A process or method for application of the blank made according to claim 5 wherein the flat blank is folded at prescribed lines to form one or two four-walled tubular structures each having two side walls and an upper and lower wall, the longitudinal ends of the blank with tongues (21 and 22) adapted to interlock, and projecting from side wall parts (6a and 6a or 4a and 4b), angled to allow the admission of the tongues into their interlocked position and moved together to interlock, the four-walled structure or structures formed substantially rectangular at the bottom part, the necks of the containers through openings in the lower wall, an upper edge of any side wall not required to fold inwardly engaged below a downwardly facing rib of the containers, the one side wall or both side walls of each structure previously folded inwardly upon its upper and lower edges the upper wall or walls moved downward to displace inwardly at least one side wall of each structure, the lower wall openings engaging a wide part of the bottle necks, the upper wall openings surrounding parts of the bottle necks or their closures, the upper wall locked with the side walls (6a and 4 or 4a and 6a) engaging the bottle necks or their closures.

Michael F.Joyce.

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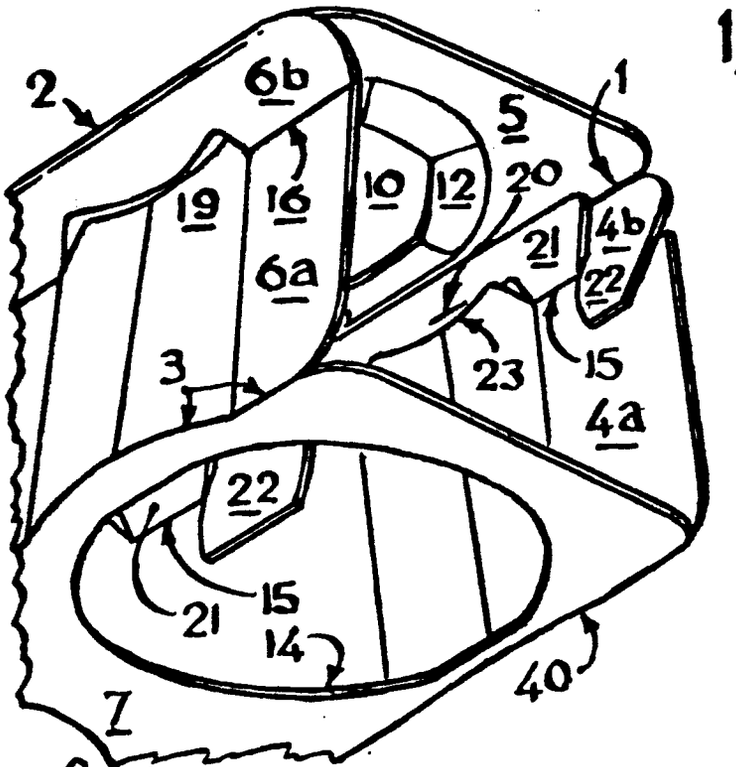


fig 3.

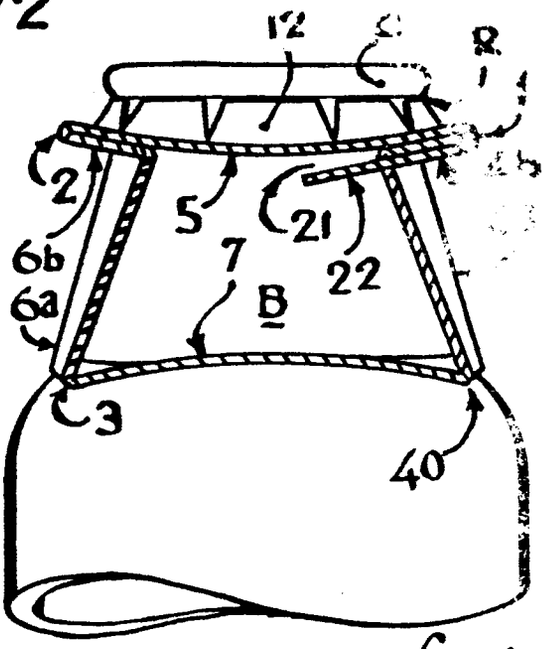


fig 4.

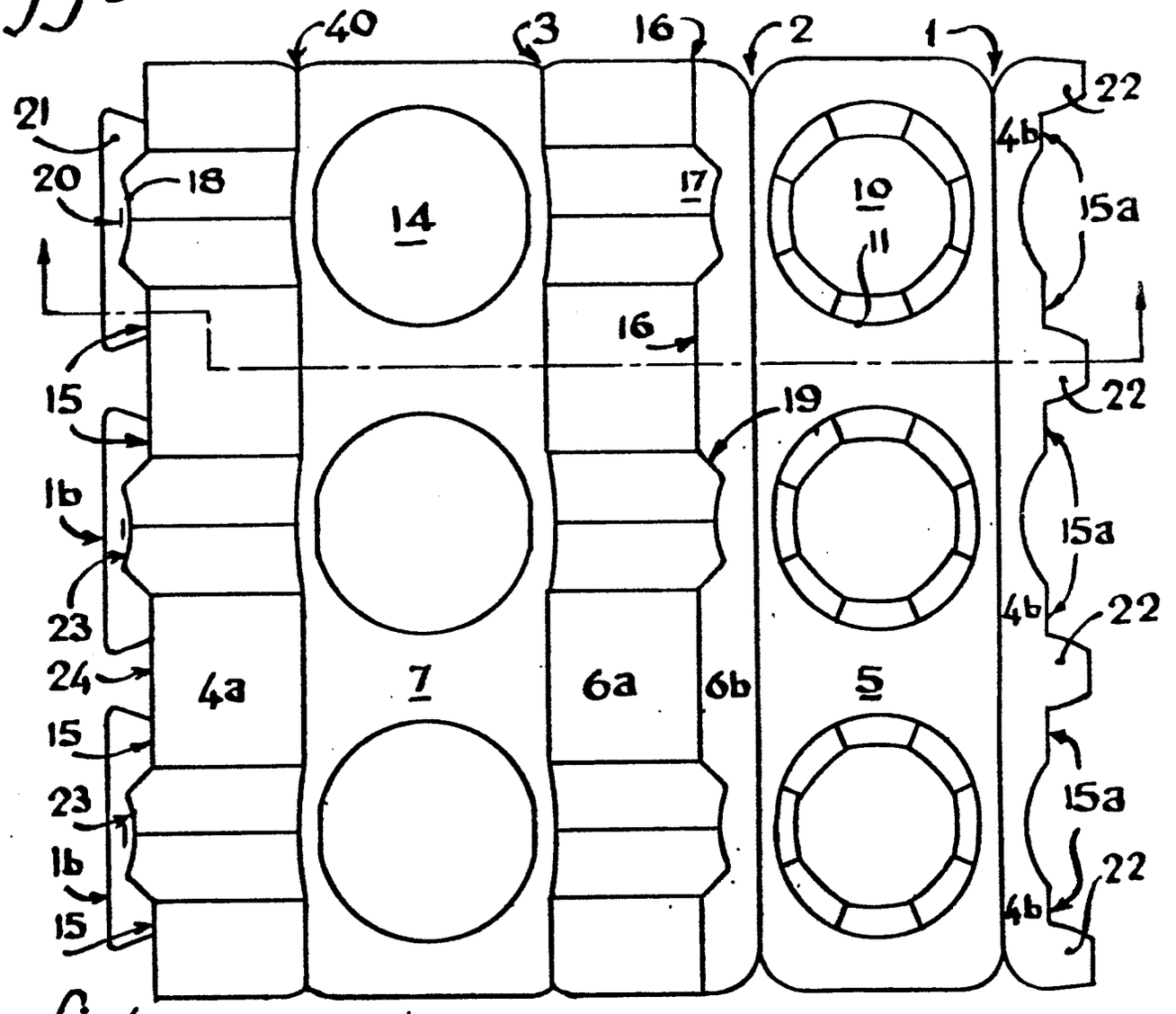


fig 1.

fig 2.

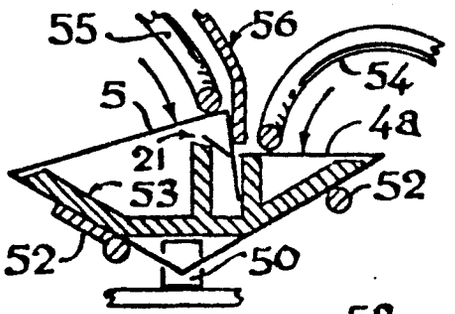


fig 6.

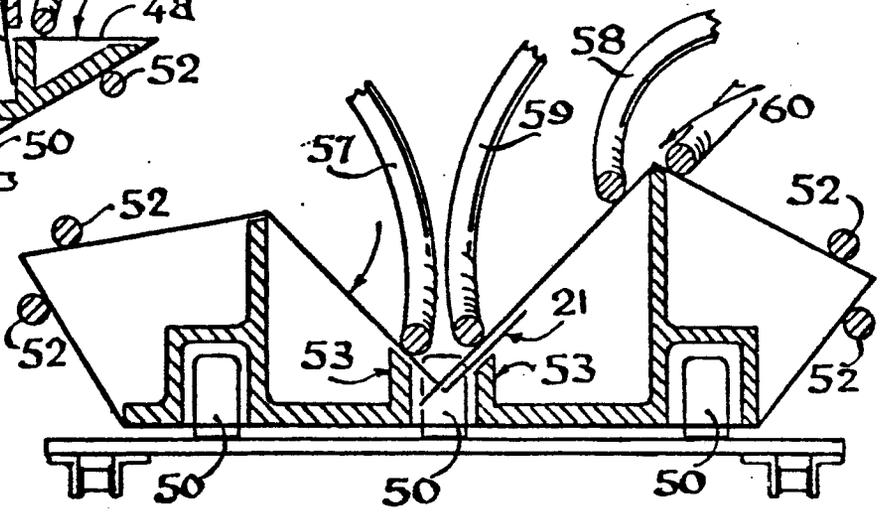


fig 7.

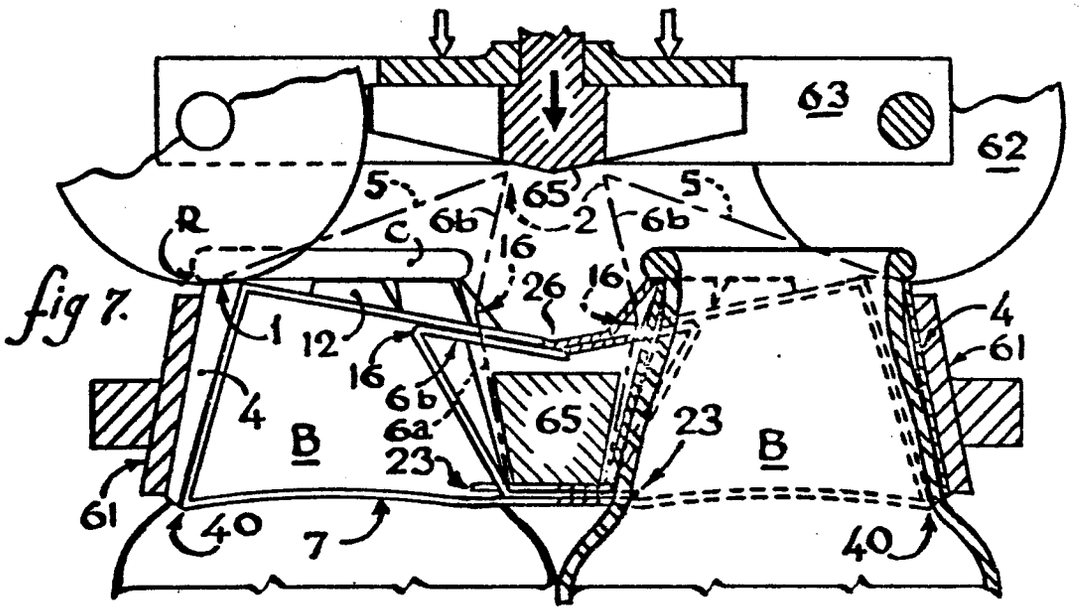
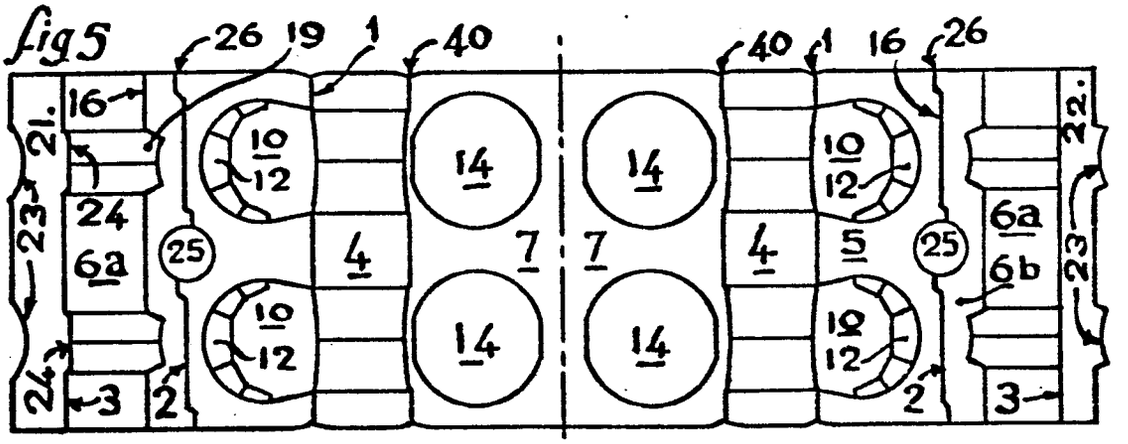


fig 5



European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 78 30 0117

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
D	FR - A - 2 155 506 (GAUNTLETT) * Patent specification * --	1
D	GB - 1 427 510 (GAUNTLETT) * Patent specification * ----	8,10

CLASSIFICATION OF THE APPLICATION (Int. Cl.²)

B 65 D 71/00
B 65 B 17/02

TECHNICAL FIELDS SEARCHED (Int.Cl.²)

B 65 D 71/00
B 65 B 17/02

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	Date of completion of the search	Examiner
The Hague	13-10-1978	VANTOMME

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