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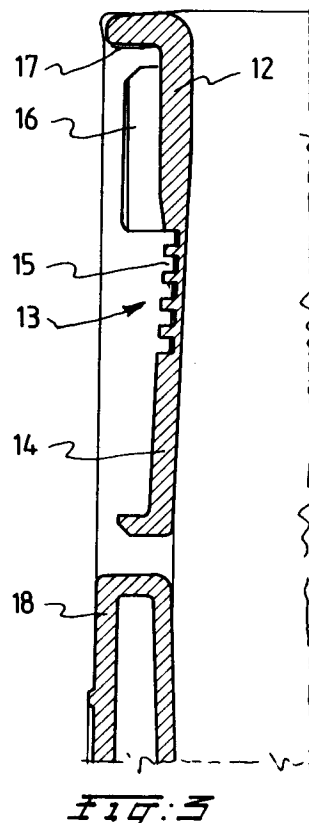
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NL-2280 GE Rijswijk (NL)(54) **Plastic crate or container.**

(57) A plastic crate or container comprises a bottom and crate walls, and in at least one crate wall an opening which is bounded at the top side by a grip, which is composed of a crate wall part which passes downwards via a flexible connecting part (13) into a flap (14) which is intended for bending upwards and lying against said crate wall part, while a wall weakening is provided in the connecting part (13) parallel to the bending axis. The connecting part is weakened by means of a number of grooves (15) which run parallel to the bending axis of said connecting part and are spaced a short distance apart. The grooves can be of such size that after bending over the flap the groove edges lie essentially against each other.

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The invention relates to a plastic crate or container, comprising a bottom and crate walls, and in at least one crate wall an opening which is bounded at the top side by a grip, which is composed of a crate wall part which passes downwards via a flexible connecting part into a flap which is intended for bending upwards and lying against said crate wall part, while a wall weakening is provided in the connecting part parallel to the bending axis.

Such a crate is known from DE-A-3 927 767. In the known crate a grip is formed by flapping up a flap which is connected by means of a film hinge to a crate wall part lying above it and making it engage in said crate wall part. A sturdy grip can be obtained by using a flap-up part, despite the low wall thicknesses of the crate wall part and the flap.

Such a grip does not, however, offer the maximum carrying comfort, since the film hinge is bent through a considerable angle, which means that the occurrence of a sharp edge at the position of said hinge is unavoidable. This is also the case where there is a double film hinge, of the type described in DE-U-89 12 048.5.

This DE-U-89 12 048.5 also describes an embodiment of a grip, in which the top side of the flap is bent downwards, the film hinge lies at the top side of the crate, and the bottom side of the grip is rounded. In this embodiment the carrying comfort is also reduced, due to the fact that in the rounded bottom side, around which the hand falls when the crate is being lifted, at least one injection moulding seam is present for manufacturing reasons.

The object of the present invention is then to provide a crate with a grip which offers increased carrying comfort.

This object is achieved according to the invention by a plastic crate of the type described in the preamble, in which the connecting part is weakened by means of a number of grooves which run parallel to the bending axis of said connecting part and are spaced a short distance apart. This allows a uniform deformation of the connecting part during bending, so that a grip without sharp corners can be produced, which provides increased carrying comfort. The deformation of the connecting part can be carried out with heating, or cold if the connecting part is sufficiently thin at the position of the weakened points.

In an advantageous embodiment the grooves are of such size that after bending over the flap the groove edges rest essentially against each other. In this way the connecting part retains its shape after bending. It is conceivable here to use V-shaped grooves and to make the sum of the angles of these grooves equal to the angle through which the flap is to be bent for it to rest against the crate wall part.

In a further advantageous embodiment, when they are not bent, the connecting part and the flap fall essentially inside the two boundary faces of the crate wall containing the grip, which faces run essentially parallel to the crate wall. The injection mould required for such an embodiment can be simple in shape and does not need to have any additional moving mould side parts which, due to the fact that they cannot be provided with cooling channels, lengthen the cycle times.

In another advantageous embodiment tongues and/or recesses are provided on the flap and the crate wall part, in order to fix the flap relative to the crate wall part after bending over, by forming a snap closure.

In a further embodiment faces which lie against each other after the flap is bent over are provided on the flap and the crate wall part. These faces can be glued to each other or heat-sealed, so that the flap is fixed relative to the crate wall part.

In another embodiment thickened parts are provided on the crate wall part and/or the flap, just fitting between the crate wall part, the connecting part and the upward bent flap. These thickened parts give the grip additional stiffness, and thereby reduce the deformation occurring during lifting of the crate.

It is advantageous to provide on the top side of the crate wall part a crate edge which projects laterally and covers the upward bent flap. A grip which is closed all the way round can be obtained in this way.

A particularly advantageous embodiment is produced if parts of the crate are made double-walled, and the double-walled crate parts are of virtually the same thickness as the grip with upward bent flap. In this way the grip can form an uninterrupted whole with the crate walls, without projecting.

It is also advantageous to provide the weakened parts in the connecting part on the outside of the crate during injection moulding, with the result that the movable mould part required for forming the grip can be situated in the mould side parts, and a simpler mould design than would be possible in the case of placing in the inner mould part will suffice. The freedom of choice for forming ribs and fixing means is also very great, since these also can be formed by the movable mould parts at the side.

The scope of protection also covers an injection mould for producing a crate according to the invention, comprising at least an inner mould part and an outer mould part, in which each of these mould parts is unsplit around the cavity part enclosed by said mould parts for forming the connecting part.

The invention will now be explained with reference to the drawings, in which:

Fig. 1 shows a crate according to the invention in perspective view;

Fig. 2 shows a view of a part of the crate from Fig. 1;

Fig. 3 shows a cross-section of the part of the crate from Fig. 2;

Fig. 4 shows a view of a part of another crate according to the invention;

Fig. 5 shows a cross-section of the part of the crate from Fig. 4; and

Fig. 6 shows a cross-section of the same part, with the flap in the bent up position.

Fig. 1 shows a crate 4 with a bottom, in which partitions 5 for placing bottles are disposed, and crate walls 6, 7, 8, 9 and two openings which are bounded at the top side by grips 10, 11, the design of which is shown enlarged in Fig. 2.

Fig. 2 shows a part of this crate with a grip, which is composed of a crate wall part 12 which passes downwards via a connecting part 13 into a flap 14. Parallel grooves 15 are provided as a weakening in the connecting part 13. Reinforcement ribs 16 and fixing tongues 17 are provided on the crate wall part 12.

Fig. 3 is a cross-section of the same crate part, in which the crate below the grip has a double wall 18, which is also bounded more or less by the same face at the inside of the crate as the flap 14, connecting part 13 and crate wall 12. It can be seen that the connecting part and the flap fall essentially inside the two boundary faces of the crate wall running essentially parallel to the crate wall.

Fig. 4 shows a view of a part of a crate, which differs from the crate of Figs. 1, 2 and 3 through the fact that different fixing means are used.

On the crate wall 20 there is a top edge 21 with tongues 22, which top edge 21 projects laterally and covers the flap 23 when the latter is bent upwards.

In Fig. 5, in which a cross-section of the crate part shown in Fig. 4 is shown, an edge 24 is provided on the flap 23 and can grip behind the tongues 22 and fix the flap 23 in the bent upward position.

Fig. 6 shows the same cross-section as that in Fig. 5, but this time with the flap 23 in the bent upward and fixed position. The ribs 25 in this case just fit between the crate wall part 20 and the flap 23.

Various variations in shape of the crates are conceivable, so long as there is no departure from the principle that the connecting part is weakened by means of a number of grooves running parallel to the bending axis of this connecting part and spaced a short distance apart, as can be seen in

the figures, so that a comfortable, rounded grip can be obtained.

The injection mould (not shown) for producing a crate according to the invention comprises, as usual, an inner mould part and an outer mould part, said mould parts enclosing a mould cavity. In order to produce a crate with a grip as described before, each of the mould parts is unsplit around the cavity part for forming the connecting part 13.

Claims

1. Plastic crate or container, comprising a bottom and crate walls (6, 7, 8, 9), and in at least one crate wall (6, 8) an opening which is bounded at the top side by a grip (11, 10), which is composed of a crate wall part (12; 22) which passes downwards via a flexible connecting part (13) into a flap (14; 23) which is intended for bending upwards and lying against said crate wall part, while a wall weakening (15) is provided in the connecting part parallel to the bending axis, **characterised in that** the connecting part (13) is weakened by means of a number of grooves (15) which run parallel to the bending axis of said connecting part and are spaced a short distance apart.
2. Plastic crate or container according to claim 1, **characterised in that** the grooves are of such size that after bending over the flap (14; 23) the groove edges lie essentially against each other.
3. Plastic crate or container according to claim 1 or 2, **characterised in that**, when they are not bent, the connecting part (13) and the flap (14; 23) fall essentially inside the two boundary faces of the crate wall containing the grip (10, 11), which faces run essentially parallel to the crate wall (6, 7, 8, 9).
4. Plastic crate or container according to one of claims 1 - 3, **characterised in that** tongues (17; 22, 24) and/or recesses are provided on the flap (14; 23) and the crate wall part, in order to fix the flap relative to the crate wall part after bending over.
5. Plastic crate or container according to one of claims 1 - 4, **characterised in that** faces which lie against each other after the flap is bent over are provided on the flap (14; 23) and the crate wall part.
6. Plastic crate or container according to one of the preceding claims, **characterised in that** thickened parts (16; 25) are provided on the

crate wall part and/or on the flap (14; 23), just fitting between the crate wall part and the upward bent flap.

7. Plastic crate or container according to one of the preceding claims, **characterised in that** on the top side of the crate wall part a crate edge (21) projects laterally and covers the upward bent flap (14; 23). 5
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8. Plastic crate or container according to one of the preceding claims, **characterised in that** parts of the crate (4) are made double-walled, and the double-walled crate parts (18) are of virtually the same thickness as the grip with upward bent flap (14; 23). 15
9. Plastic crate or container according to one of the preceding claims, **characterised in that** the weakened side of the connecting part faces the outside of the crate (4) during the injection moulding. 20
10. Injection mould for producing a crate or container according to one or more of the preceding claims, comprising at least an inner mould part and an outer mould part, in which each of these mould parts is unsplit around the cavity part enclosed by said mould parts for forming the connecting part (13). 25
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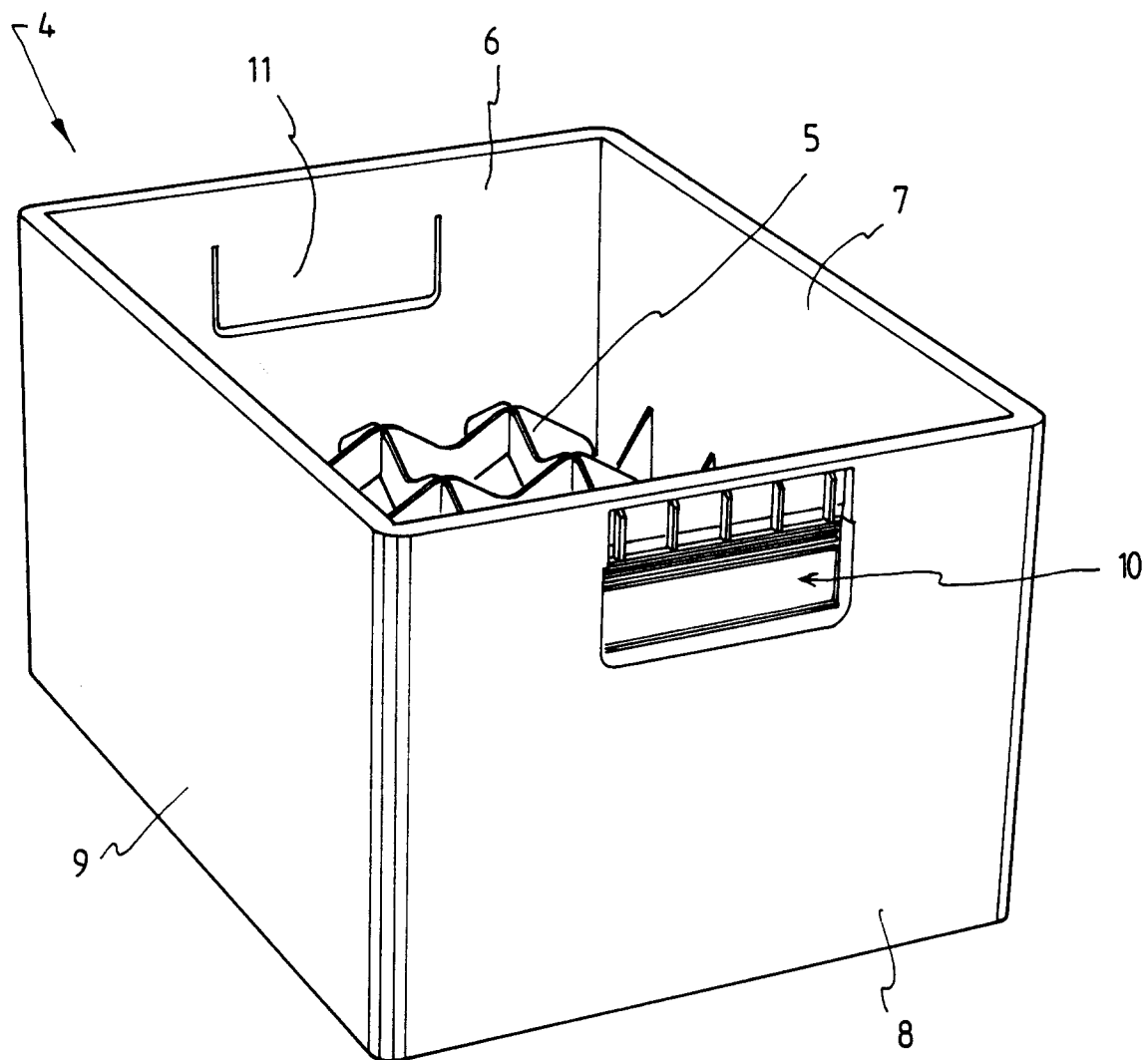
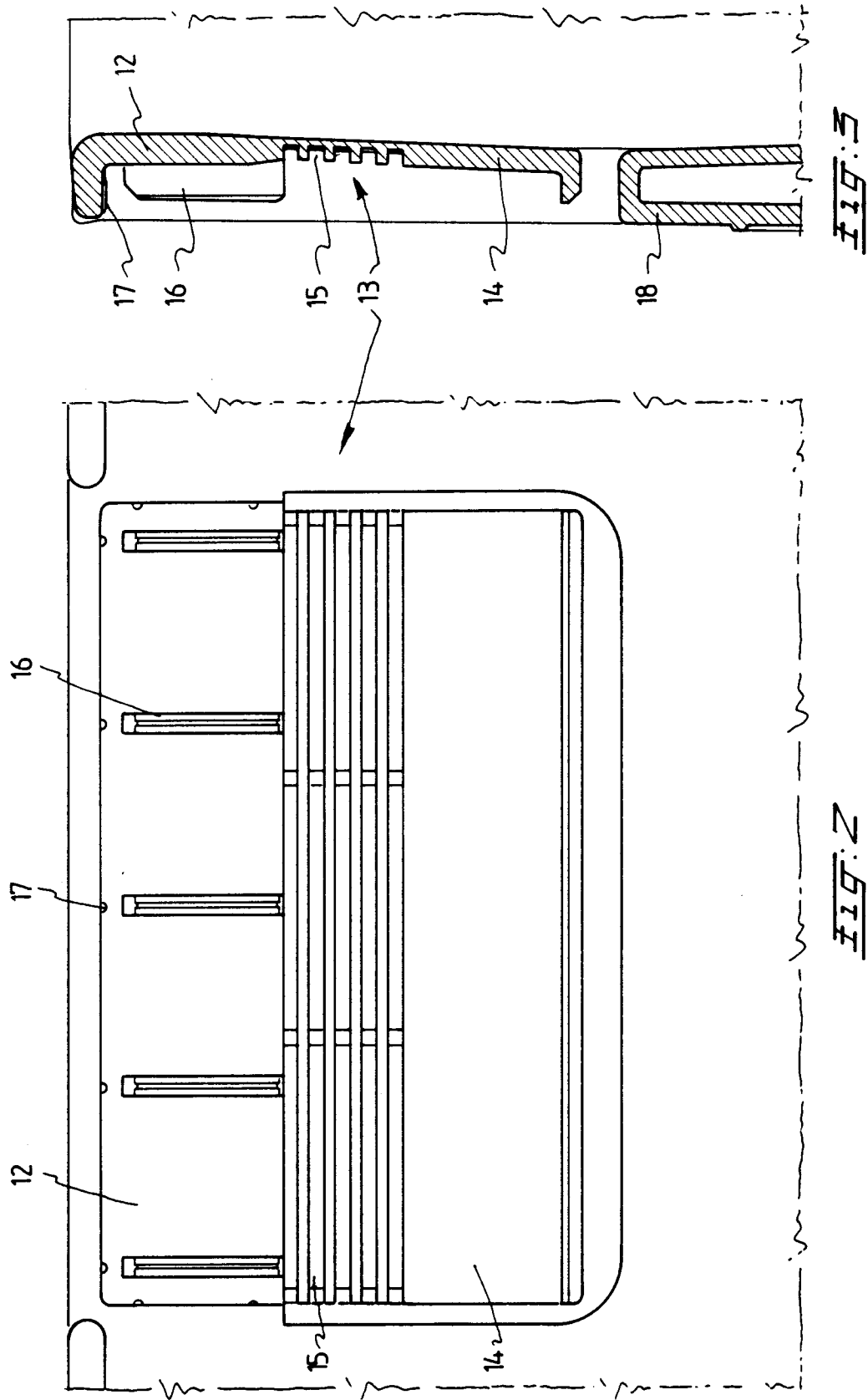
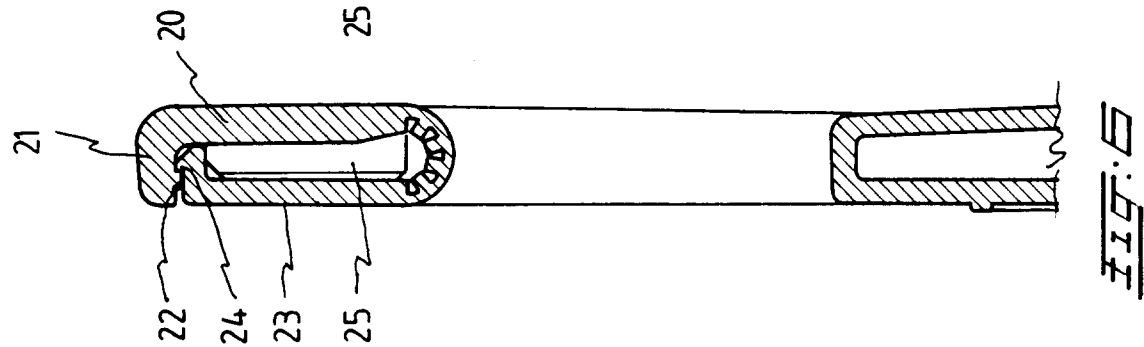
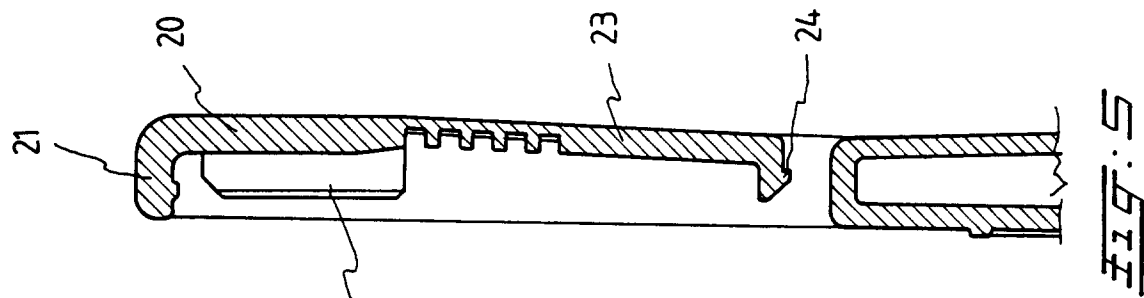
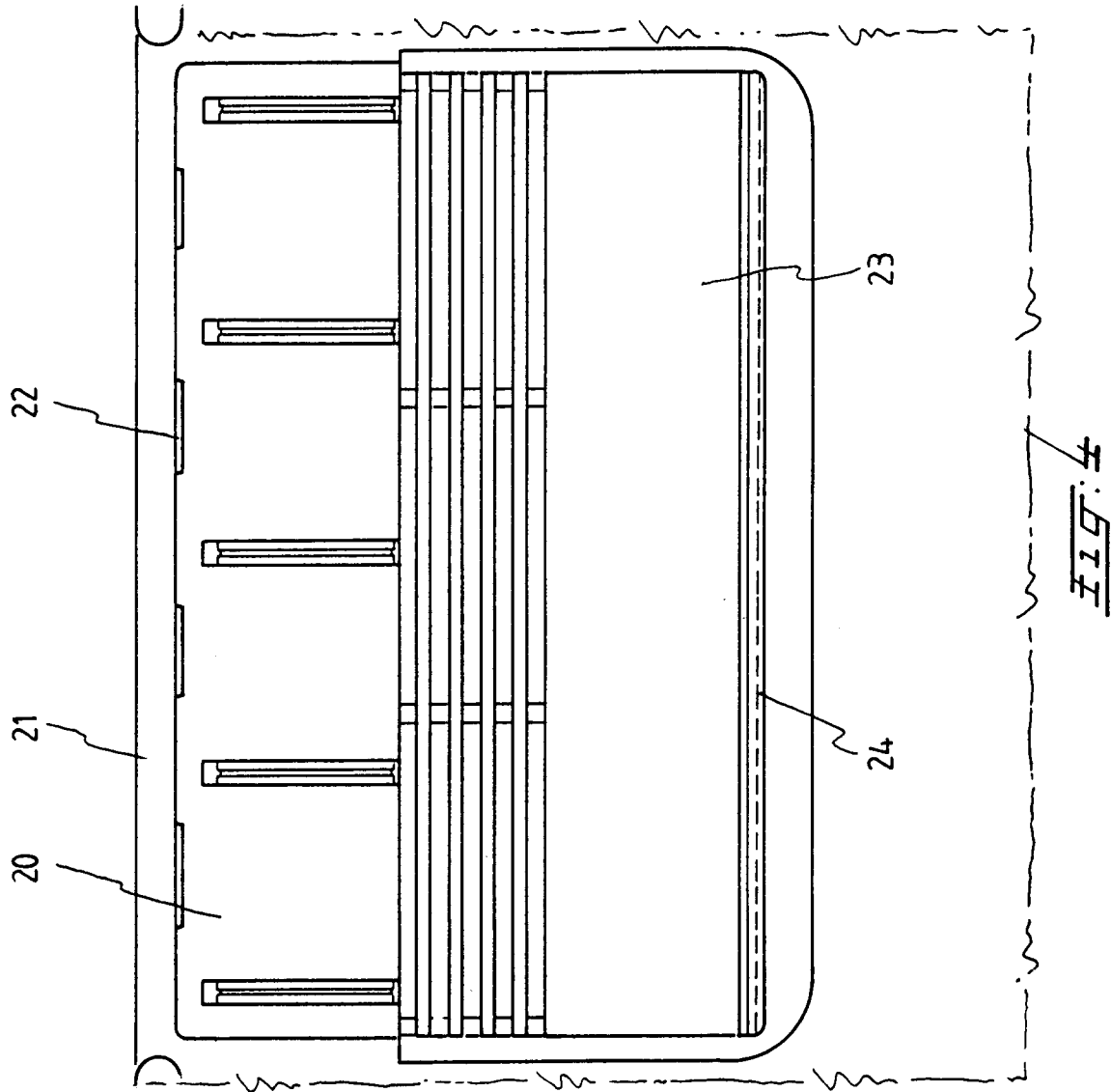


Fig. 1







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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 3085

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A,D	DE-U-8 912 048 (KOOSE) * page 5, line 17 - page 7, line 4; figures 1-3D *	1,4-7	B65D25/30 B65D1/38
A,D	DE-A-3 927 767 (GÖTZ) * figures 1-3 *	1,4-7	
A	EP-A-0 019 336 (WAVIN B.V.) * page 9, line 19 - page 10, line 23; figures 3,4 *	10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D A45F A45C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 03 FEBRUARY 1993	Examiner BERRINGTON N.M.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	