(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 030 064**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **80201132.0**

(22) Date of filing: **28.11.80**

(51) Int. Cl.³: **B 65 D 21/02**

(30) Priority: **01.12.79 NL 7908710**

(43) Date of publication of application:
10.06.81 Bulletin 81/23

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: **STAMICARBON B.V.**
Postbus 10
NL-6160 MC Geleen(NL)

(72) Inventor: **Minkhorst, Jan Hendrik Karel**
Geleenstraat 38
6151 EZ Munstergeleen(NL)

(72) Inventor: **Habets, Jan Hubert**
Kochstraat 22
6164 HB Geleen(NL)

(74) Representative: **Hoogstraten, Willem Cornelis Roeland et al,**
OCTROOIBUREAU DSM Postbus 9
NL-6160 MA Geleen(NL)

(54) **Plastic case.**

(57) The constituent, equally high wall sections at the bottom side of a double-walled case are shaped so that they, when the case is stacked with identical cases, enclose the upper edges thereof, the wall elements of the stacked cases being in one vertical plane.

EP 0 030 064 A1

./...

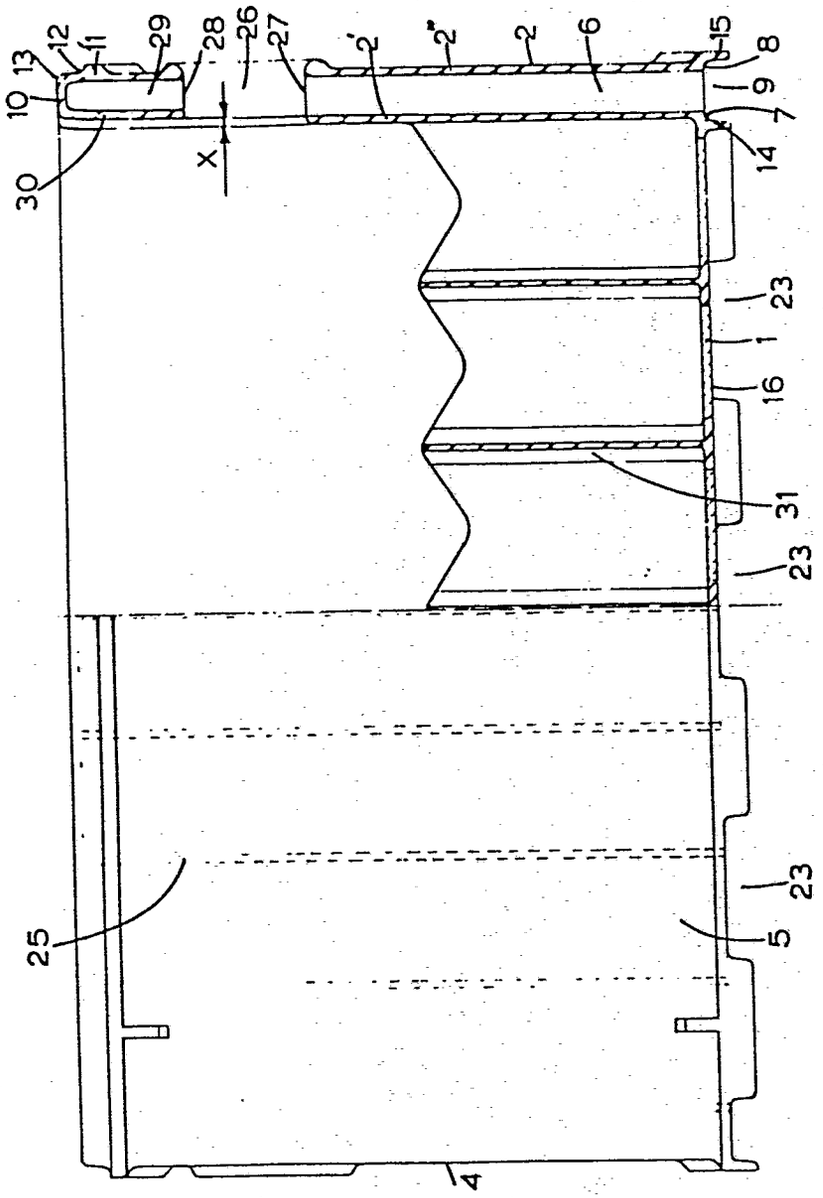

Fig. 3

1

PLASTIC CASE

The invention relates to a stackable case of plastic with a substantially rectangular bottom and four upright side walls each consisting of an inner wall plate and an outer wall plate, which plates are separated by an intermediate space, disposed parallel to each other and connected with each other by cross partitions.

Cases of which the side walls, or part thereof, for instance the corner parts, are double-walled are known from the USA patent specifications No.'s 3.506.154 and 3.314.568.

As is normally also a feature of stackable single-walled cases, the double-walled cases have along the circumference of the bottom a ridge or stacking edge, which coacts in the stacking with the upper edges of an underlying case. The vertical surface of the ridge is adjusted to the internal dimensions of the upper edges of the case so that the case can sink into an underlying case to the height of the ridge and the case comes to rest with the horizontal part of the ridge on the top side of the walls.

The ridge of the case described in the USA patent specification No. 3.506.154 is formed by leaving out the outer wall plate at the bottom side to the height of the ridge. In the USA patent specification No. 3.314.568 the same is done in the double-walled corner sections.

Although with these cases centring of the stacks is obtained in that the two wall plates of a wall are in one plane with the two corresponding wall plates of an underlying case, it can yet be observed, especially with high stacks, that the outer wall plates do not remain in one plane relative to each other, which has an adverse effect on the transfer of loads. Another disadvantage of the known cases is that the outer wall plates of the lowermost case cannot transfer loads effectively to the floor because these outer wall plates terminate at the height of the ridge above the floor and the loads have to be transferred via the cross partitions and the inner wall plate. When the lowermost case is heavily loaded, the outer wall plate is deformed. This deformation continues into the superimposed cases and may lead to, among other things, cracking of cross partitions, which are not at all visible or only with difficulty,

and also because all the cases are used as lowermost unit in a random alternation, it is likely that after a certain time the entire stock of cases is considerably affected as regards the reliability in terms of load transfer.

The purpose of the invention is to provide a double-walled case which is capable of efficient load transfer to the floor and which, further, forms stacks in which non-alignment of the outer wall plates is prevented to a considerable extent.

According to the invention this is achieved in that the inner and the outer wall plate of the case are equal in height and in that the intermediate space abruptly widens at the lower end of the walls over a certain height, thus forming horizontal shoulder surfaces in the inner and outer wall plates so that the widened section of the intermediate space of such a case in a stack encloses the upper ridge of the underlying case bilaterally and the case comes to rest thereon with its shoulder surfaces.

With the case according to the invention, both wall plates bear upon the floor and a case encloses the walls of an underlying case bilaterally. The advantage of this is good load transfer to the floor and stable alignment of the walls of stacked cases.

To obtain the widening of the intermediate space it is sufficient for the wall plates to be flanged outwardly in respect to the inwardly intermediate space, by one plate thickness. This entails only a minor enlargement of the outer dimensions of the case.

It is recommendable to close the intermediate space with a horizontal wall section at the top side of the walls, because then the overall width of the wall at the top side is stabilized and the possibility of penetration of dirt into the intermediate space is reduced.

In order to give the bottom side of the outer wall plate an additional supporting surface in stacking, the case may be provided with a circumferential horizontal rib with a horizontal top surface of which the horizontal thickness is equal to the thickness of the outer wall plate, the distance between the top surface of the rib and the top edge of the wall being equal to the distance between the shoulder surfaces and the bottom edge of the wall. This rib, together with the part of the outer wall plate which widens the intermediate space, provides the case with additional reinforcement, while adding very little to the outer dimensions.

In order to facilitate the stacking somewhat, the outer wall plate may be left out at the bottom side of the walls over some distance from the corners. Preferably, this is effected in that each of the grooves formed by the shoulder surfaces and the inner sides of the wall plates of a wall extends through the outer wall plate of an adjacent wall.

Preferably the case is designed so that the bottom face of the case is above the base plane through the bottom ends of the walls, because then the bottom side of the case can be provided with bottom-reinforcing protrusions without causing the side walls to lose their function of transferring loads to the floor. The ends of the bottom protrusions may reach to the floor, giving additional support to the bottom.

In order to make the case also suitable for cross-bond stacking, where some walls cross each other perpendicularly and others are on top of each other in one vertical plane, the bottom face of the case may be provided with bottom protrusions the ends of which are below the plane through the shoulder surfaces, the bottom protrusions forming grooves the bottoms of which are located in the plane through the shoulder surfaces, which grooves are normal to the side walls of the case and extend through the walls.

When the bottom protrusions do not reach beyond the plane through the shoulder surfaces it is also possible to remove locally wall sections which protrude below this plane.

The width of the bottom grooves is at least equal to twice the total wall thickness. The total wall thickness is understood here to be the wall thickness including the horizontal thickness of the rib running along the circumference of the case.

When the crate wall is provided with a horizontal wall section at its top side to close the intermediate space, and there are handle grip openings in the walls, it is desirable for reasons of manufacturing techniques (e.g. in injection moulding) to narrow the intermediate space above the hand grip openings a little by locally shifting a wall plate into the intermediate space. Such a case can be manufactured with a mould which has upright cores which reach from the bottom edge of the walls to near the top side of the case. Surprisingly, it has been found that said shifting of the wall plate by at least its thickness already permits of

using a mould with cores reaching up to the top edge. The total wall thickness thus decreases very slightly above the hand grip opening, and the narrowing moreover, for a person looking into the case from above, provides a visual indication of the place of the hand grips.

In order to keep the outer wall as even as possible it is preferred to shift the inner wall plate into the intermediate space.

The hand grips, which substantially are formed by rectangular openings in the inner and outer wall plates of at least one pair of opposite side walls, are preferably bounded left and right by vertical cross partitions in the intermediate space which extend from the shoulder surfaces to the top side of the walls, while the top and bottom sides of the hand grips communicate with the intermediate space.

It is advantageous to provide vertical cross partitions in the intermediate space at the places where the bottom grooves extend through the side walls, because in cross bond stacking, where a bottom groove encloses two upper ridges of underlying cases, part of the load transfer can be effected through these cross partitions.

Under certain conditions it may be advantageous to choose different thicknesses for the inner and outer wall plate. Thus a larger outer wall plate thickness may be chosen for cases which will be exposed to impacts and wear during transport in- or outside the factory, where the outside of the case will suffer most.

For the transport of bottles the case can be provided with a compartment configuration. Preferably, the compartment configuration according to the Netherlands patent specification No. 155500 is chosen.

The invention will now be elucidated with reference to an embodiment represented in the drawing, in which:

Fig. 1 is a top view of a case according to the invention;

Fig. 2 is a bottom view of a case according to the invention;

Fig. 3 represents a case half in a cross-sectional view, half in a side view along the line III-III in fig. 1 and

Fig. 4 shows a case half in a cross-sectional view, half in a front view taken along the line IV-IV in fig. 1.

In the drawings 1 indicates the substantially rectangular bottom of a case, and 2,3,4 and 5 indicate the double upright side walls.

Each of the double side walls consists of an inner wall plate and an outer wall plate, which for wall 2 in fig. 3 are indicated by 2' and 2" respectively, and for wall 3 in fig. 4 by 3' and 3" respectively.

The intermediate space 6 between the parallel inner and outer wall plates abruptly widens near the bottom, thereby forming shoulder surfaces 7 and 8 and a widened intermediate space section 9. The wall plates in the drawing are displaced by one plate thickness. The top side of the wall is provided with a horizontal wall section 10 to close the intermediate space at the top.

Just below the top edge of the case there is a horizontal rib 11 on the circumference of the case, which rib has a horizontal top surface 12 the horizontal width of which is equal to the plate thickness of the outer wall plate. The distance between the horizontal top surface 12 and the top edge 13 of the wall is equal to the length of the wall sections 14 and 15 projecting beyond the shoulder surfaces 7 and 8.

When the cases are stacked the wall sections 14 and 15 of a superimposed case enclose the upper edge of the underlying case, with the shoulder surfaces 7 and 8 resting on the horizontal wall section 10, while also the outer wall plate finds additional support on the upper surface 12 of the rib 11.

Because the inner and outer wall plates are equally high, the bottommost case of a stack is able to transfer the loads to the floor via both wall plates.

The case represented in the drawing has a bottom 1, of which the bottom face 16 is above the base plane through the bottom ends of the walls, while this bottom face 16 is provided with bottom protrusions 17 (see fig. 2) which reach to the floor and so the bottom bears on the floor.

As can be seen in fig. 2, the groove 18 which is formed by the wall sections 14, 15 and the shoulder surfaces 7, 8 and which corresponds with the widened intermediate space section 9 in figures 3 and 4 extends into the adjacent wall parts at the corner points 19,20,21 and 22, so that near the corner points below the shoulder surface 8 there is no outer wall plate section 15.

In this manner it is easier to find the correct centring when the cases are stacked.

The bottom protrusions 17 form three short grooves 23 and two long grooves 24, in fig. 2 also indicated by A and B. The grooves are normal to the side walls of the case, the short grooves being located at distances of 1/4, 2/4 and 3/4 of the length of the case from the shorter side of the case, and the long grooves at distances of 1/3 and 2/3 of the width of the case from the longer side of the case. The grooves extend through the side walls and have a width of at least twice the total thickness of the side walls, i.e. including the rib 11.

The case provided with the above described bottom grooves can be used for tower stacking as well as for cross bond stacking.

Between the side wall plates there are cross partitions 25. Especially with cases which are stacked in cross bond it is advantageous for reasons of load transfer to choose the place of the vertical partitions so that they are over the bottom grooves 23 and 24.

The case in the represented design has in each of the shorter side walls a hand grip, which is formed by a rectangular opening 26 through both wall plates. This opening is bounded left and right by a vertical cross partition 25. The top and the bottom side of the opening communicate with the intermediate space 6. The part of the intermediate space 6 above the opening 26 indicated by 29 is narrower than the rest of the intermediate space 6 because section 30 of the inner wall place 2' is shifted into the intermediate space over a distance equal to its plate thickness x. Without affecting the double-wall concept of the case and with maintenance of the horizontal wall 25 section 10 on the entire top side of the case it is thereby possible to produce the case by injection moulding by means of relatively simple moulding equipment, as it is possible to use a mould with cores reaching from the bottom side to the top side.

To make it suitable for transport of bottles, the case may be provided with an internal compartment configuration such as the configuration 31 in fig. 1 for 24 bottles, which are indicated by dotted lines 32. The bottles are arranged in 6 parallel rows of four, the bottles in two adjacent rows being staggered relative to each other in accordance with the Netherlands patent specification No. 155500.

0030064

CLAIMS

1. Stackable case of plastic with a substantially rectangular bottom and four upright walls, each consisting of an inner and an outer wall plate, which plates are separated by an intermediate space, are parallel to each other and connected by cross partitions, characterized in that the inner and the outer wall plate are equal in height and in that the intermediate space abruptly widens near the lower end of the walls over a certain height, thus forming horizontal shoulder surfaces in the inner and outer wall plate so that the widened section of the intermediate space of a case in a stack can enclose the upper edge of the underlying case bilaterally and rest thereon with its shoulder surfaces.

2. Case according to claim 1, characterized in that the inner and outer wall plates are flanged outwardly, in respect to the intermediate space, by one plate thickness.

3. Case according to claim 1 or 2 characterized in that the outside of the case is provided with a circumferential horizontal rib, the horizontal thickness of which is equal to the thickness of the outer wall plate, the distance between the top surface of the rib and the top edge of the wall being equal to the distance between the shoulder surfaces and the bottom edge of the wall.

4. Case according to any one of the claims 1-3, characterized in that each of the grooves formed by the shoulder surfaces and the inside of the wall plates extends through the outer wall plate of the adjacent wall.

5. Case according to any one of the claims 1-4, characterized in that the bottom face of the case is above the base plane defined by the bottom ends of the walls.

6. Case according to claim 5, characterized in that there are bottom protrusions on the bottom of the case of which the ends are below the plane defined by the shoulder surfaces, and form bottom grooves of which the bottoms coincide with the plane through the shoulder surfaces, which grooves are normal to the side walls of the case and extend through the walls and have a width at least twice the total thickness of the side walls.

7. Case according to any one of the claims 1-6, characterized in that there are vertical cross partitions in the intermediate space located at the places where the bottom grooves extend through the side-walls.

8. Case according to any one of the claims 1-7, characterized in that at least one pair of opposite walls is provided with openings serving as hand grips, the intermediate space above the hand grips being narrowed by locally shifting at least one of the wall plates into the intermediate space.

9. Case according to claim 8, characterized in that the intermediate space above the hand grip is narrowed by locally shifting the inner wall plate inwardly over a distance equal to its thickness.

10. Case according to any one of the claims 1-9, characterized in that the case has substantially rectangular hand grip openings which at the top and bottom side communicate with the intermediate space and the left and right side of which are bounded by cross partitions in the intermediate space reaching from the shoulder surfaces to the top edge of the case.

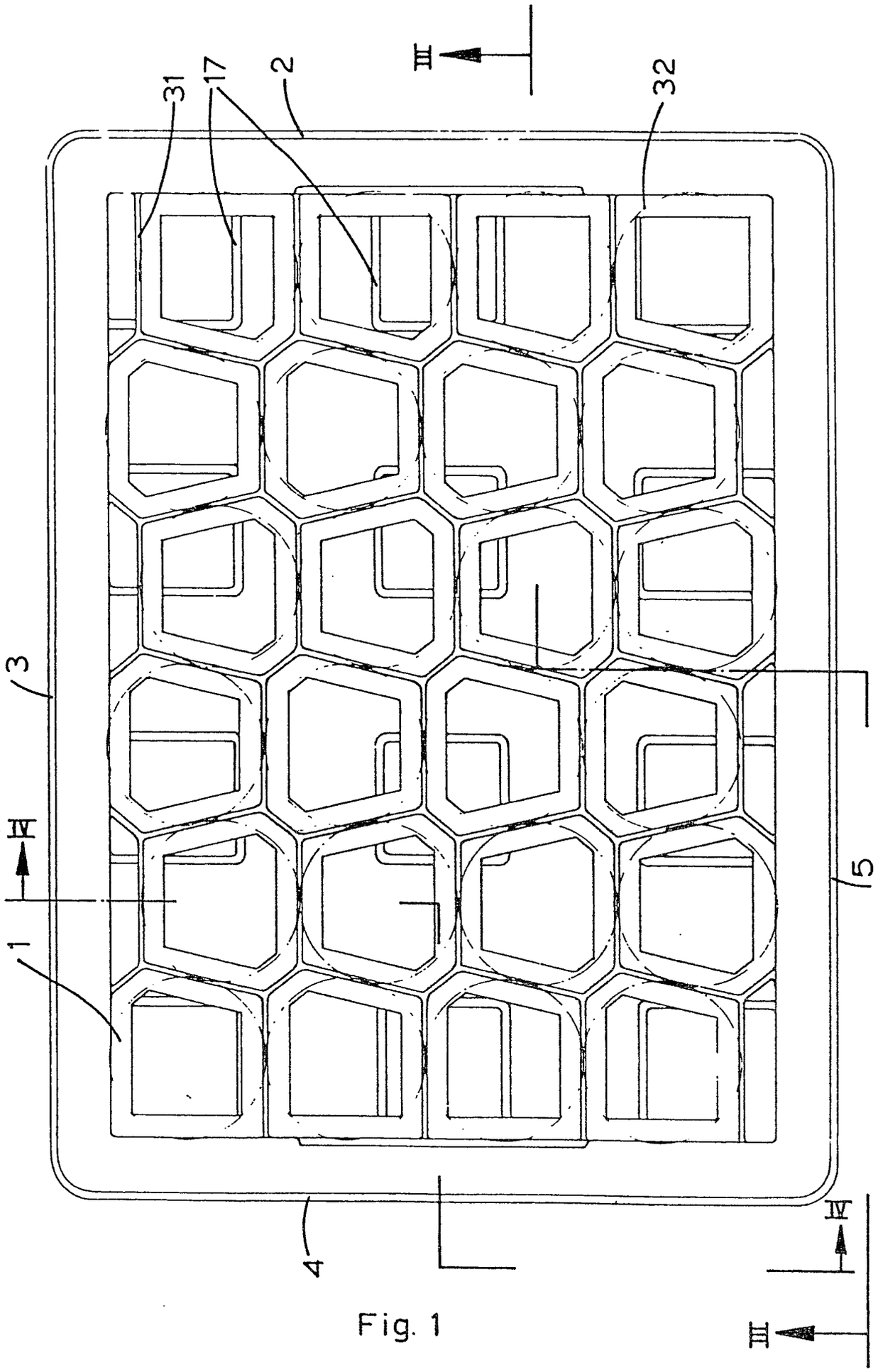

Fig. 1

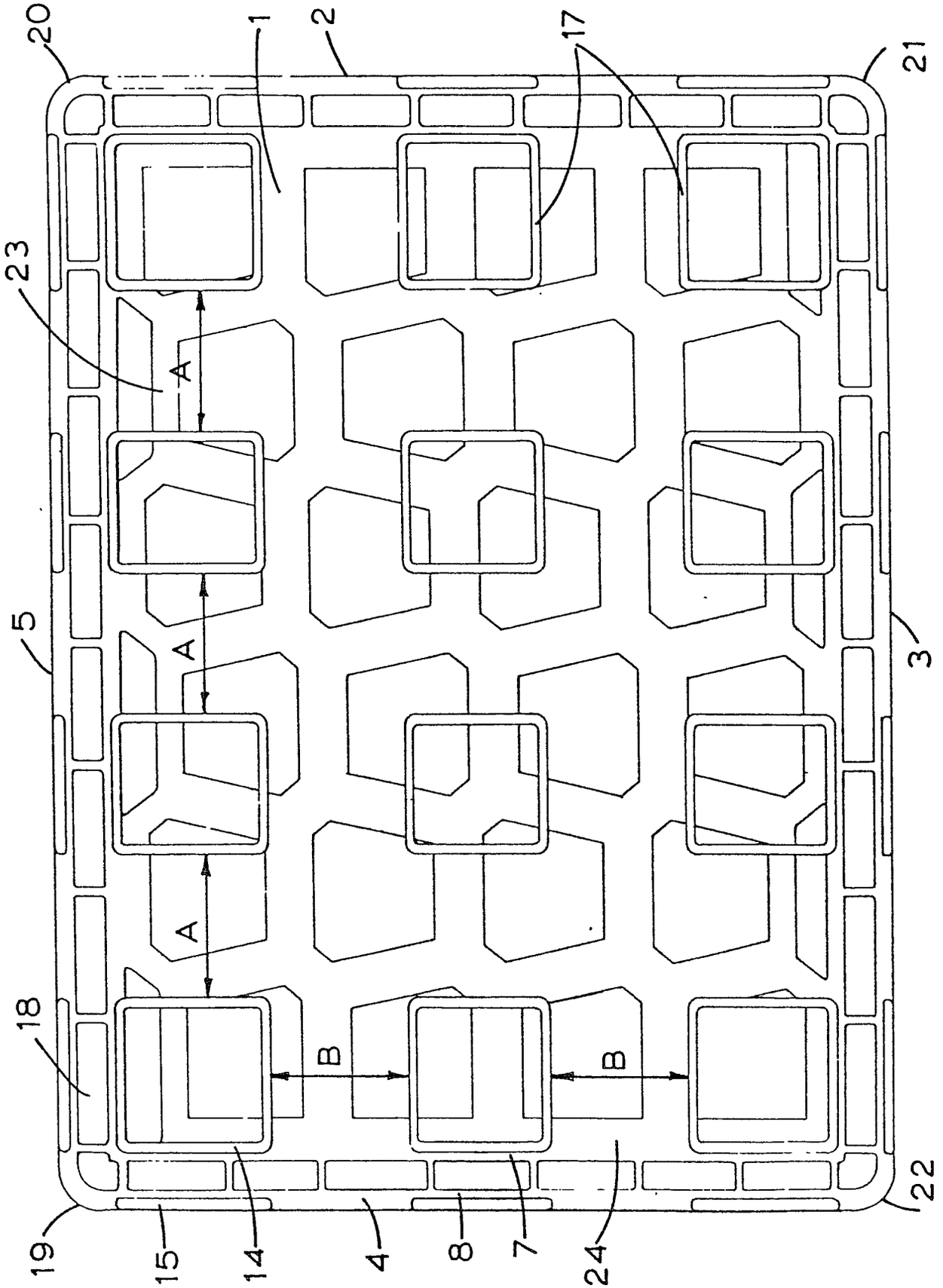

Fig. 2

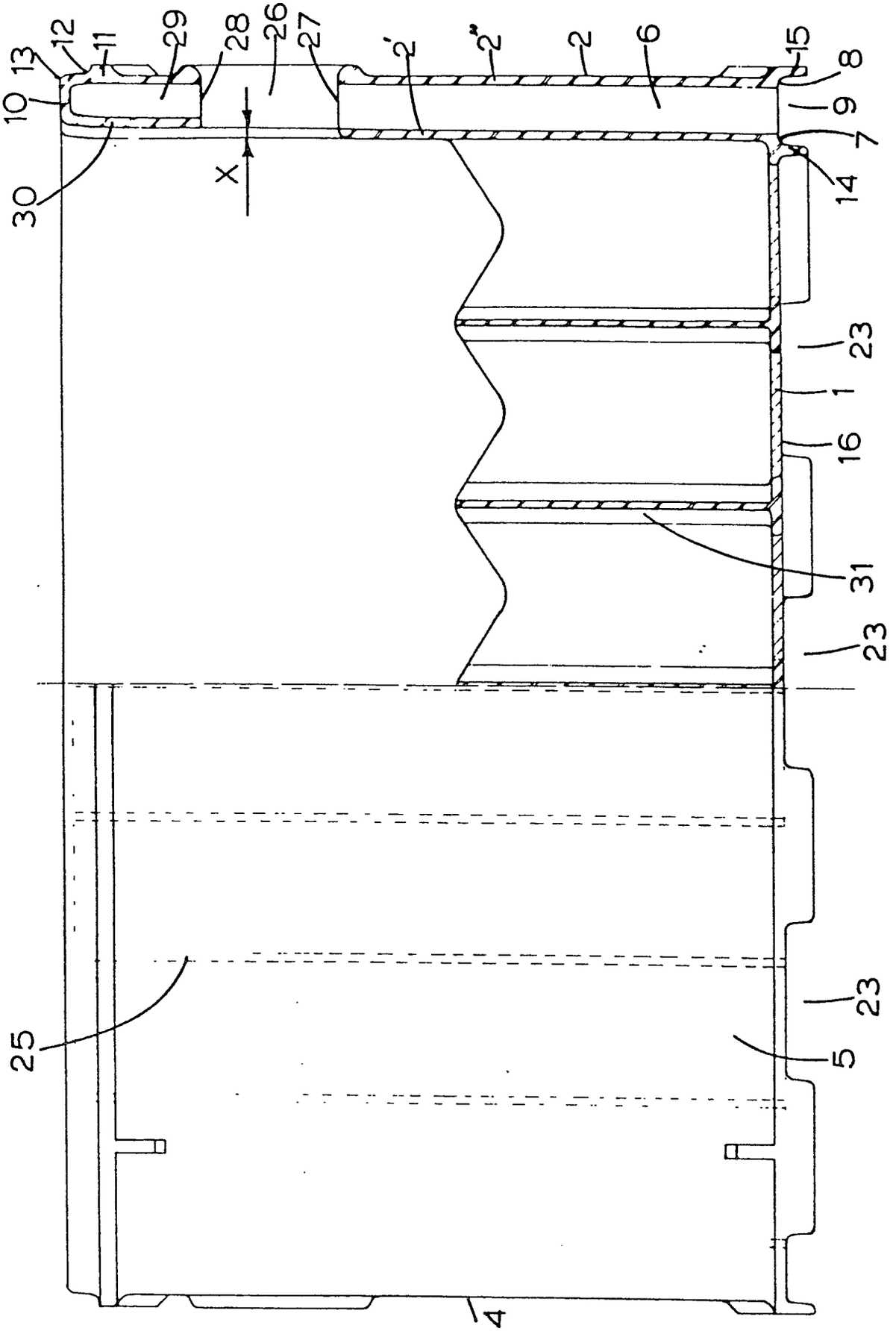

Fig. 3

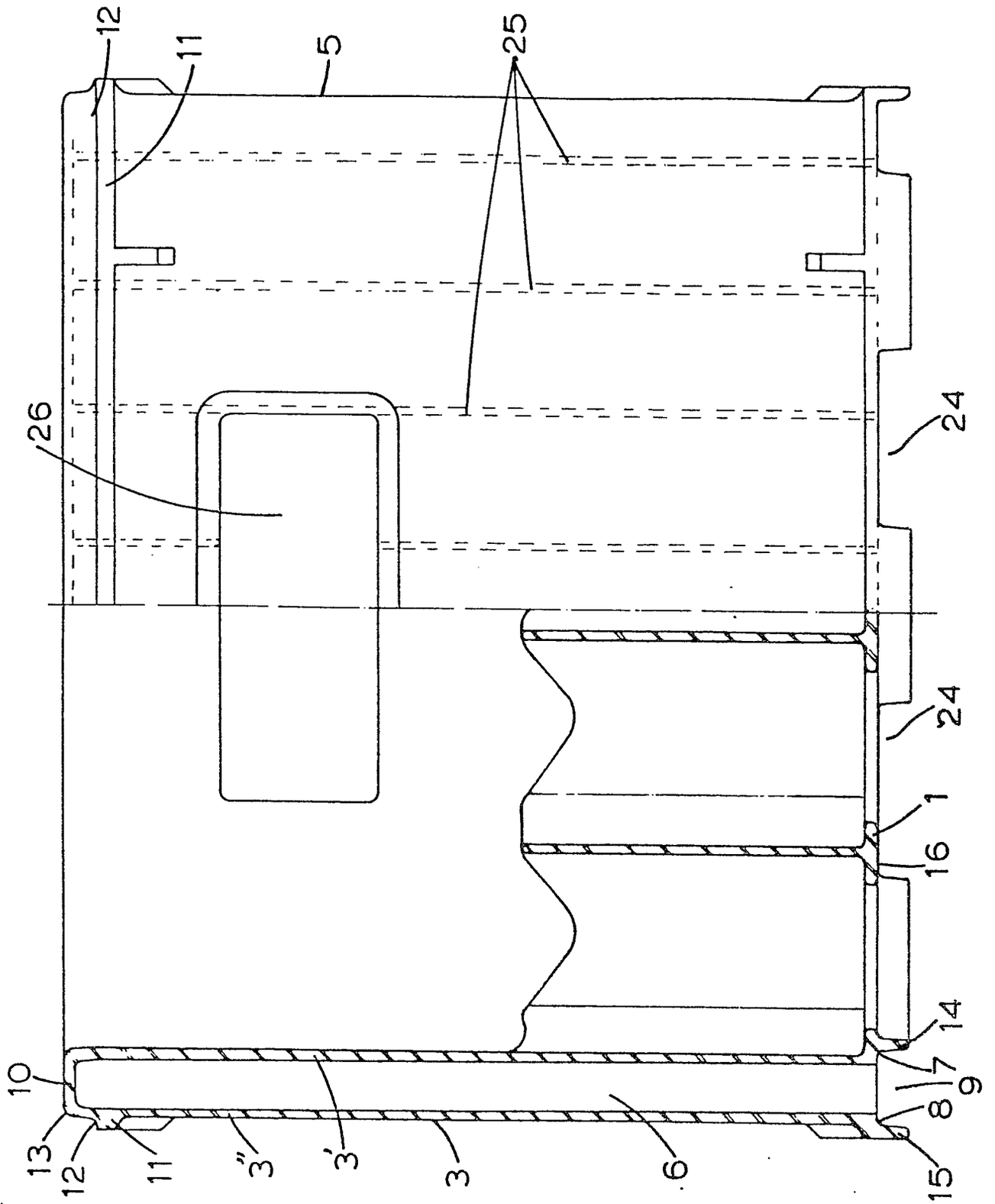

Fig. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application number EP 80 20 1132

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.³)
X	GB - A - 1 253 561 (CIDEL) * page 2, lines 38 to 70; page 2, line 115 to page 3, line 79; figures 1,2,4,5,6,7 * --	1	B 65 D 21/02
	DE - A - 2 723 963 (STUCKI) * page 8, line 1 to page 9, last line; figures * --	1,3,4, 5	
	LU - A - 68 370 (MAUSER) * the whole document * --	1	TECHNICAL FIELDS SEARCHED (Int. Cl.³) B 65 D
	GB - A - 1 409 046 (GPG HOLDINGS LTD OF CRANFORD) * page 4, line 27 to page 5, line 74; page 6, line 42 to page 7, line 37; figures 1 to 5,8 * --	5,6,8, 10	
	FR - A - 1 358 471 (SAMAC) * the whole document * --	1	CATEGORY OF CITED DOCUMENTS
	US - A - 4 113 329 (THURMAN) * the whole document * --	1	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
A	DE - A - 2 856 598 (WAVIN) ./.		

The present search report has been drawn up for all claims

&: member of the same patent family, corresponding document

Place of search	Date of completion of the search	Examiner
The Hague	25-03-1981	MARTENS

EPO Form 1503.1 06.78

European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 80 20 1132

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	
	* page 9, last paragraph to page 12, paragraph 2; figures 1 to 3 *		TECHNICAL FIELDS SEARCHED (Int. Cl. ³)