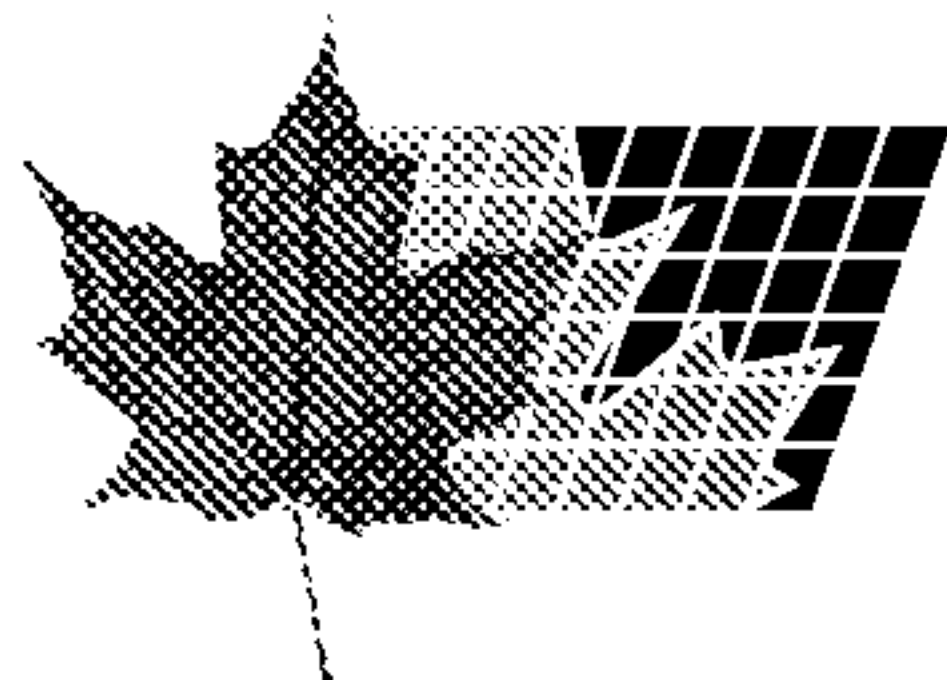




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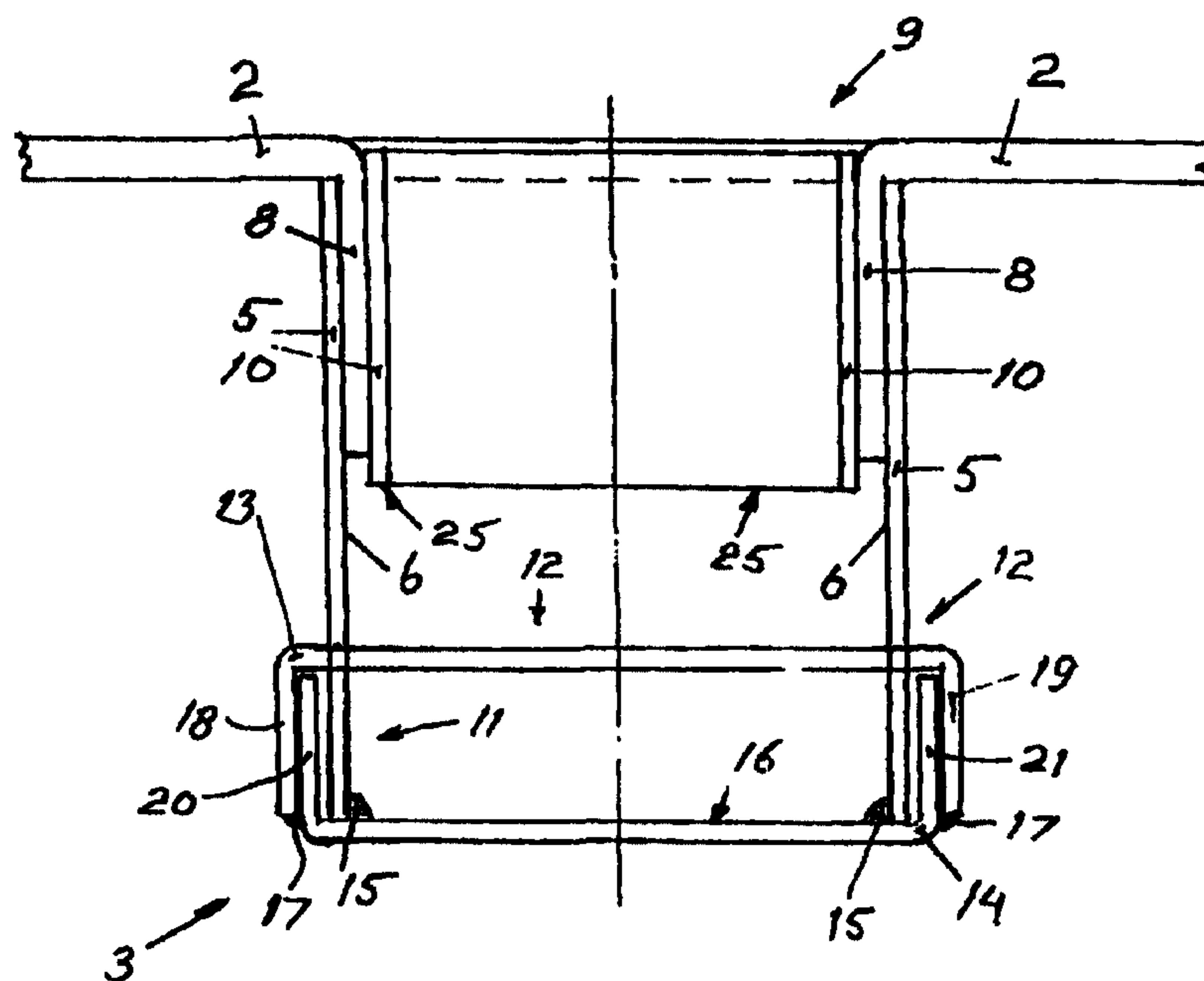
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(51) Int.Cl.⁶ B65D 19/34

(30) 1998/05/14 (9801709-8) SE

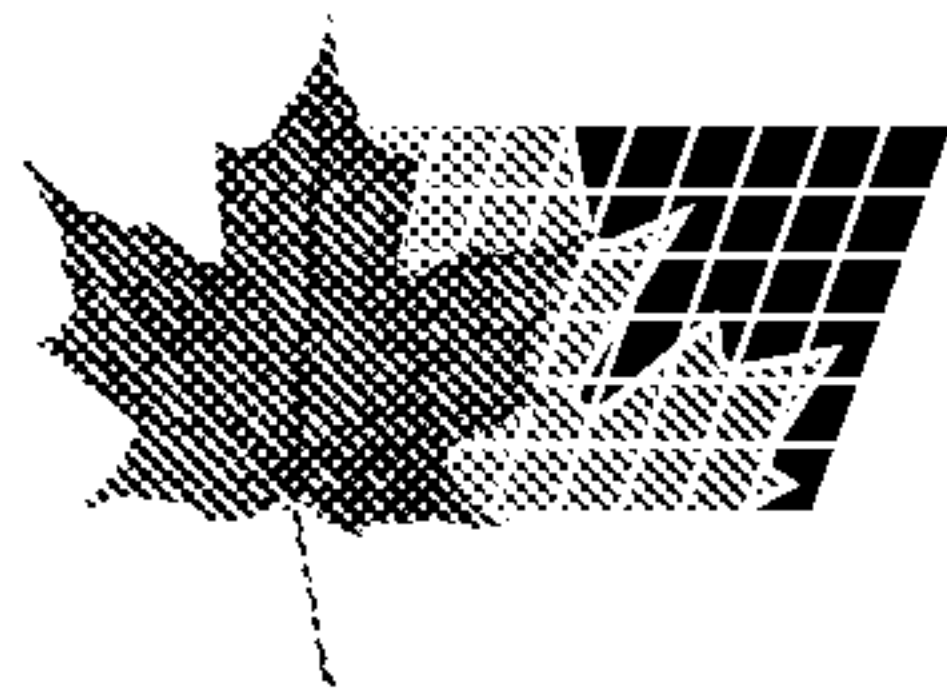
(54) **PALETTE ET SON PROCEDE DE FABRICATION**

(54) **PALLET AND METHOD OF MANUFACTURING THE PALLET**



(57) L'invention concerne un ensemble palette (1), de préférence une palette à usage unique, constitué d'un plancher supérieur (2), de supports inférieurs (3) et de cales d'épaisseur (4) situés entre le plancher supérieur (2) et les supports (3) et faisant office de pieds de palette. Les cales d'épaisseur sont constituées d'éléments de support tubulaires (5) qui sont fixés en position par rapport au plancher supérieur (2) contre des pattes de blocage (8) qui sont repliées vers le bas, autour de lignes de pliure circulaires (7) formées dans le plancher supérieur. Les pattes de blocage sont solidement fixées entre les éléments tubulaires (5) et des tubes de blocage (10) qui sont insérés par le haut dans des ouvertures (9) préalablement formées dans le plancher (2) par le pliage

(57) The invention relates to a pallet arrangement (1), preferably to a pallet intended for one-time use only, comprising an upper deck plate (2), bottom runners (3) and spacer elements (4) located between the deck plate (2) and the bottom runners (3) and functioning as pallet feet. The spacer elements are comprised of supportive tubular elements (5) which are fixed in position relative to the deck plate (2) against locking flaps (8) that are folded down around circular fold lines (7) punched in the deck plate. In turn, the locking flaps are firmly clamped between the tubular spacer elements (5) and locking tubes (10) that are inserted from above through openings (9) that were formed in the deck plate (2) by folding down the locking flaps (8). The invention also



(21) (A1) **2,331,982**

(86) 1999/05/11

(87) 1999/12/02

vers le bas des pattes de blocage (8). L'invention porte également sur un procédé de fabrication de ladite palette, qui consiste à fixer les cales d'épaisseur (4) à la face inférieure du plancher (2) par découpage dans lesdites ouvertures (9) de sorte que des pattes de blocage (8) soient formées, sur lesquelles les éléments de support tubulaires (5) sont fixés à l'aide de tubes de blocage (10) qui sont insérés par ajustement pressé dans les ouvertures (9) et qui compriment fermement les éléments d'espacement tubulaires (5) contre lesdites pattes de blocage (8), après quoi les extrémités libres (11) des éléments d'espacement tubulaires sont collés solidement aux supports inférieurs (3).

relates to a method of manufacturing the pallet, in which method attachment of the spacer elements (4) to the underside of the deck plate (2) is achieved by punching out in said deck plate openings (9) such as to form locking flaps (8) over which the tubular spacer elements (5) are fixed with the aid of locking tubes (10) which are pressed into the openings (9) and which firmly press the tubular spacer elements (5) against said locking flaps (8), whereafter the free ends (11) of the tubular spacer elements are glued firmly to the bottom runners (3).

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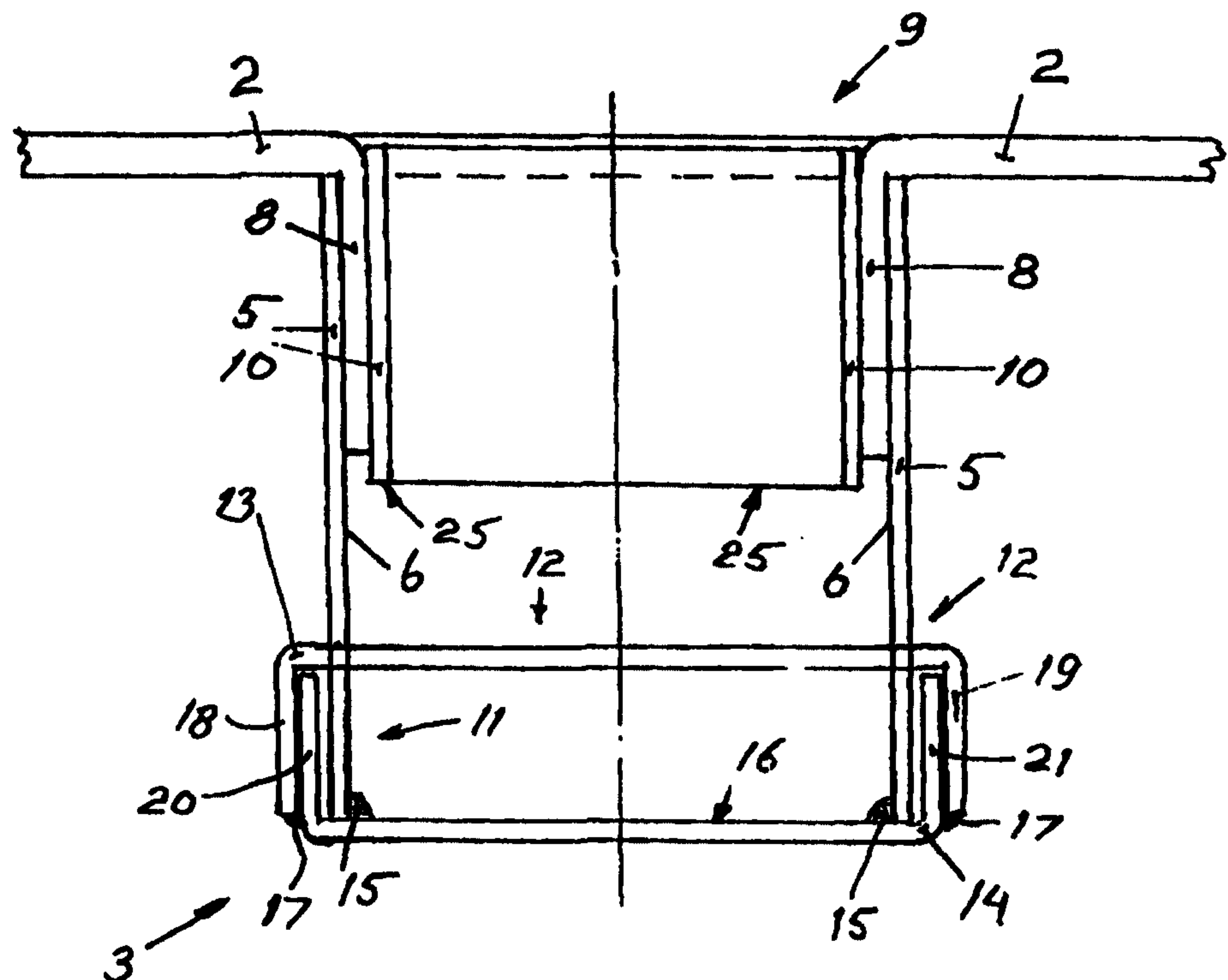
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B65D 19/34	A1	(11) International Publication Number: WO 99/61330 (43) International Publication Date: 2 December 1999 (02.12.99)
(21) International Application Number: PCT/SE99/00792 (22) International Filing Date: 11 May 1999 (11.05.99) (30) Priority Data: 9801709-8 14 May 1998 (14.05.98) SE (71)(72) Applicant and Inventor: STERNHAMN, Nils-Åke [SE/SE]; Leksbergsvägen 41, S-542 44 Mariestad (SE). (74) Agent: KRANSELL & WENNBORG AB; P.O. Box 27834, S-115 93 Stockholm (SE).	(81) Designated States: CA, NO, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Swedish).</i>	

(54) Title: PALLET AND METHOD OF MANUFACTURING THE PALLET

(57) Abstract

The invention relates to a pallet arrangement (1), preferably to a pallet intended for one-time use only, comprising an upper deck plate (2), bottom runners (3) and spacer elements (4) located between the deck plate (2) and the bottom runners (3) and functioning as pallet feet. The spacer elements are comprised of supportive tubular elements (5) which are fixed in position relative to the deck plate (2) against locking flaps (8) that are folded down around circular fold lines (7) punched in the deck plate. In turn, the locking flaps are firmly clamped between the tubular spacer elements (5) and locking tubes (10) that are inserted from above through openings (9) that were formed in the deck plate (2) by folding down the locking flaps (8). The invention also relates to a method of manufacturing the pallet, in which method attachment of the spacer elements (4) to the underside of the deck plate (2) is achieved by punching out in said deck plate openings (9) such as to form locking flaps (8) over which the tubular spacer elements (5) are fixed with the aid of locking tubes (10) which are pressed into the openings (9) and which firmly press the tubular spacer elements (5) against said locking flaps (8), whereafter the free ends (11) of the tubular spacer elements are glued firmly to the bottom runners (3).



PALLET AND METHOD OF MANUFACTURING THE PALLET

5 The present invention relates to a pallet arrangement,
and then preferably to a pallet that is intended for one-
time use only and made of recoverable paperboard materi-
al, said pallet comprising an upper deck plate, bottom
runners and spacer elements located between the deck
10 plate and the bottom runners and functioning as pallet
feet. The invention also relates to a method of manufac-
turing such pallets.

Several different types of recoverable paperboard pallets
15 are at present commercially available. All of these
pallets have a good bearing capacity and quality, to a
greater or lesser extent. Because of increasing demands
with respect to the recovery of materials, there will be
needed within the near future a pallet or load carrier
20 that is both recoverable and possesses the capacities of
a wooden pallet. These requirements include four-way
handling, i.e. a facility which enable the pallet to be
handled with a lifting implement from four different
directions. Another requirement is that the pallet shall
25 be able to withstand outdoor climates for long periods of
time and capable of managing a load of ten tonne.
Finally, it shall be possible to drive over the bottom
runners of the pallet with a pallet trolley, for instance
from one long side. It is seldom that the disposable
30 pallets at present available commercially fulfil these
conditions.

The object of the present invention is to provide an
arrangement with which the drawbacks encumbered by
35 earlier known pallet constructions of similar types are
eliminated while fulfilling all four of the aforesaid
conditions. Another object of the invention is to provide
a method of manufacturing such pallets. The charac-
teristic features of the present invention are set forth

in the following claims. The inventive pallet effectively fulfils its intended functions and can be produced readily and inexpensively. The inventive pallet may be produced from a recoverable paper material, said deck
5 plate being made of thick corrugated fibreboard, while remaining pallet components, such as spacer elements and bottom runners, are made of solid paperboard. Although the inventive pallet is primarily intended for one-time use only, its robust construction will enable it to be
10 used more than once in some cases. The pallet can also withstand a great deal of "punishment". Despite the toughness of the pallet and its high load-bearing capacity, which can be likened to the load-bearing capacity of a standard wooden pallet, the inventive
15 pallet weighs only about 3.5 kg in comparison with a wooden pallet, which weighs about 14 kg. This is an important advantage, particularly with respect to air transportation where the weight of the pallets used is highly significant from an economic viewpoint. The
20 structural components of the pallet are locked and fixed in position very effectively, among other things by virtue of the special fixation of the spacer elements against the underside of the deck plate, these spacer elements functioning as pallet feet.

25

The special design of the spacer elements also enables packaging to be easily secured in position on the load-carrying deck, by virtue of the fact that said elements include internally a locking edge for locking coaction
30 with flap formations and locking hooks or barbs that project out from the packaging material for locking coaction with the spacer elements.

The invention will now be described in more detail with
35 reference to a preferred embodiment thereof and also with reference to the accompanying drawings, in which Figure 1 illustrates schematically and in perspective a preferred embodiment of an inventive pallet;

Figure 2 is a partial, schematic view from above of one of the nine apertures punched from the deck plate by means of punch knives and having an outer circular fold line prior to folding down the formed flaps into abutment
5 with an underlying spacer element, and subsequently pressing-in a locking tube which presses against the flaps and the outer surface of the tubular spacer element;

Figure 3 is a partial, schematic perspective view from
10 above which illustrates the stage at which the inner locking tube has been pressed down into a spacer element so as to lock said element against the locking flaps which are now pressed together ;

Figure 4 is a partial, schematic cross-sectional view of
15 a fitted spacer element, taken on the line IV-IV in Figure 1, said view illustrating how locking is achieved with a spacer element against the underside of the deck by means of locking flaps folded down therefrom and with the aid of the inner locking tube;

20

Figure 5 corresponds to the cross-sectional view of the spacer element shown in Figure 4, and shows a locking flap extending down from packaging placed on the deck and extending through the spacer element so as to lock said
25 element.

As will be evident from the preferred embodiment of the inventive pallet 1 illustrated schematically and in perspective in Figure 1, the pallet comprises an upper
30 deck plate 2, bottom runners 3, and spacer elements 4 which are located between the deck plate 2 and the bottom runners 3 and which function as pallet feet. The deck plate 2 of the illustrated embodiment is comprised of corrugated paperboard having a thickness of about 7 mm,
35 while the bottom runners 3 and the spacer elements 4 are comprised of solid board having a thickness of about 4 mm. This provides a pallet which is recoverable and has the facilities afforded by a wooden pallet.

The spacer elements 4 of the illustrated embodiment comprise supportive tubular elements 5 which are fixed positionally to the deck plate 2 through the medium of the inner cylindrical surface 6 of tube 5, against
5 sector-shaped locking flaps 8 punched out from the deck plate and folded out around circular folding lines 7. These locking flaps 8 are intended to hold the tubular spacer elements 5 in place by virtue of being firmly clamped between the inner cylindrical surface 6 of the
10 tubular spacer elements 5 and respective locking tubes 10 which can be pressed into the spacer elements 4 from above and in through the openings 9 that are formed in the deck plate when folding down the locking flaps 8. The free ends 11 of the tubular spacer elements have glued
15 thereto bottom runners 3 formed by top and bottom U-shaped pallet runners 13, 14 which are joined together with their respective legs 18-21 facing towards each other. The top, U-shaped pallet runners 13 have punched therein holes 12 for receiving the tubular spacer
20 elements 5, these elements being affixed to the inner bottom surface 16 of the U-shaped pallet runners 14 by means of an adhesive 15. The free part of the legs 18, 19 of the top U-shaped pallet runners 13 is affixed positionally to the legs 20, 21 of the bottom U-shaped pallet
25 runners 14 by means of an adhesive 17. As a result of the pressure exerted by the inner locking tubes 10 outwardly against the locking flaps, the tubular spacer elements 5 positioned beneath the deck plate 2 are held with a firmness sufficient to obviate the need of glue or some
30 other adhesive for this purpose. The locking flaps will preferably have a length that enables them to be clamped firmly between the inner barrel surface 6 of the tubular spacer elements 5 and the locking tubes pressed into said tubular spacer elements. The length of the locking flaps
35 8 will preferably be slightly smaller than half the inner diameter of the tubular spacer elements 5 or will correspond to half said diameter. The length of the locking tube 10 may vary, although its diameter will be

slightly smaller than the inner diameter of the tubular spacer elements 5.

In the case of the illustrated embodiment, respective locking flaps 8 are sectorial in shape with respective sector bases forming the circular fold lines 7.

The packaging placed on the pallet can be affixed to the pallet deck 2 with the aid of flap formations 22 which project out from the packaging and which have on their forward, free parts latching hooks or barbs 23, 24 that can be hooked onto a bottom edge 25 of a respective locking tube 10.

15 An inventive pallet is manufactured in the following manner.

Nine apertures are punched in the upper deck plate 2 with the aid of punching knives, in sectorial segments that have an outer, circular weakening in the form of respective fold lines 7, such as to form a plurality of locking flaps 8 which can be folded down along the fold lines 7. Spacer elements 4 in the form of the supportive tubular spacer elements 5 are then placed beneath the deck plate 2 so that the outwardly projecting locking flaps 8 will lie with respective spacer elements. locking tubes 10 are then inserted into the openings 9 formed when punching out the locking flaps 8, such as to press the locking flaps against the inner barrel surface 6 of the tubular spacer elements 5 whilst, at the same time, pressing down the locking tubes 10 with the locking flaps 8 firmly clamped between the tubular spacer elements 5 and the locking tubes 10. The runners 3, consisting of mutually fastened top and bottom U-shaped pallet runners 13, 14, are then glued to the free ends 11 of the tubular spacer elements 5 by means of an adhesive 15 in conjunction with inserting the ends 11 into the holes 12 punched in the top U-shaped pallet runner 13 of the bottom runners 3.

Claims

5 1. A pallet arrangement, preferably of the type
intended for one-time use only, comprising an upper deck
plate (2), bottom runners (3) and spacer elements (4)
located between the deck plate (2) and the bottom runners
(3) and functioning as pallet feet, said spacer elements
10 (4) having the form of supportive tubular elements (5)
and being fixed positionally in relation to the deck
plate (2) against locking flaps (8) folded out from
circular fold lines (7) punched in said deck plate (2),
through the medium of the inner cylindrical surface (6)
15 of said tubular spacer element, said locking flaps (8)
being in turn, clamped firmly between the tubular spacer
elements (5) and locking tubes (10) pressed from above
into openings (9) formed in the deck plate (2) by
punching-out and folding down said locking flaps (8),
20 **characterized in**

that the bottom runners (3) are comprised of top and
bottom U-shaped pallet runners (13,14) which are joined
together with their respective legs (18-21) facing
towards each other at the same time as the legs (18,19)
25 of the upper pallet runners extend over and are affixed
to the legs (20,21) of the lower pallet runners; and in
that the upper pallet runners (13) include apertures
(12) for coaction with the tubular spacer elements (5),
the lower free ends (11) of which are affixed to the
30 inner bottom surface (16) of the lower runners (14) with
the aid of an adhesive (15).

2. A pallet arrangement according to Claim 1, **charac-**
terized in that the locking flaps (8) have a length which
35 enables the flaps to be clamped firmly between the inner
barrel surface (6) of the tubular spacer elements (5) and
the locking tubes (10) pressed into said tubular spacer
elements (5).

3. A pallet arrangement according to Claim 2, **characterized** in that the length of the locking flaps (8) is slightly smaller than half the inner diameter of the tubular spacer elements (5) or corresponds to half of said diameter; and in that the length of the locking tubes (10) may vary and that the diameter of said tubes is slightly smaller than the inner diameter of the tubular spacer elements (5).
- 10 4. A pallet arrangement according to Claim 1, **characterized** in that the locking flaps (8) are sectorial in shape with the base of respective sectors forming the circumferential fold lines (7).
- 15 5. A pallet arrangement according to Claim 1, **characterized** in that the bottom edges (25) of respective locking tubes (10) are able to coact lockingly with flap formations (22) which project out from the packaging material placed on the pallet (1) and which are provided with locking hooks or barbs (23, 24), such as to hold the packaging material firmly in position on said pallet.
- 20 6. A pallet arrangement according to Claim 1, **characterized** in that the deck plate (2) is comprised of corrugated fibreboard that has a thickness of about 7 mm; and in that the tubular spacer elements (5), the locking tubes (10) and the bottom runners (3) are comprised of solid board.
- 30 7. A method of manufacturing a pallet, preferably a pallet for one-time use only comprising an upper deck plate (2), bottom runners (3), and spacer elements (4) located between the deck plate (2) and the bottom runners and functioning as pallet feet, **characterized by**, before mounting of the spacer elements (4) having the form of tubular spacer elements below the deck plate (2), the steps of punching in the deck plate (2) with the aid of punch knives apertures or openings (9) that present sectorial locking flaps (8) having respective outer,
- 35

circumferentially extending weakenings in the form of fold lines (7), folding the locking flaps (8) down along said fold lines (7) into abutment with the inner barrel surface (6) of respective tubular spacer elements (5) and
5 fixing said flaps in abutment with said barrel surface (6) with the aid of locking tubes (10) that can be pressed down through the openings (9) punched in said deck, said locking flaps (8) affixing the position of respective tubular spacer elements (5) with the aid of
10 said locking tubes (10), by glueing the bottom runners (3) firmly to the free ends (11) of the tubular spacer elements (5).

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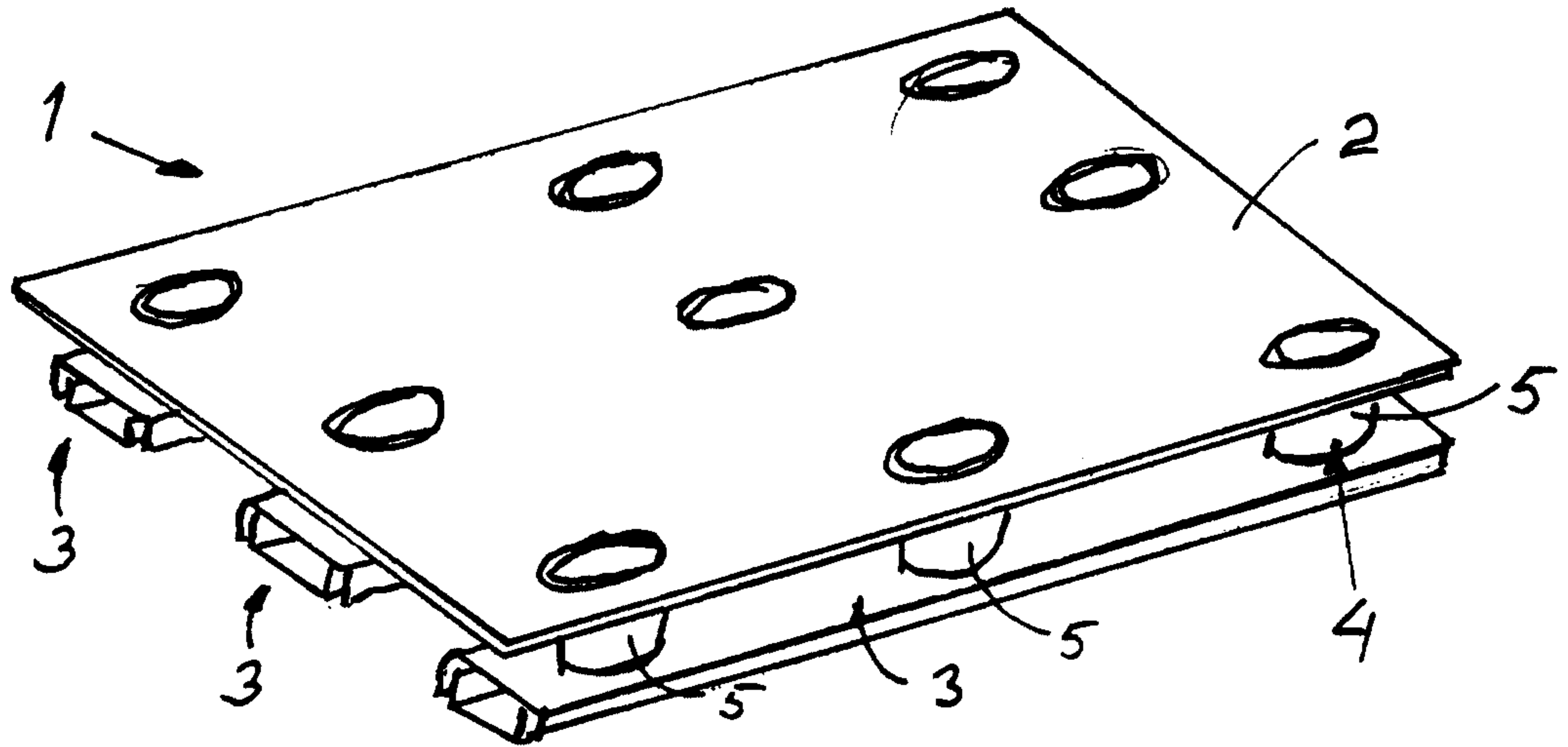


Fig. 1

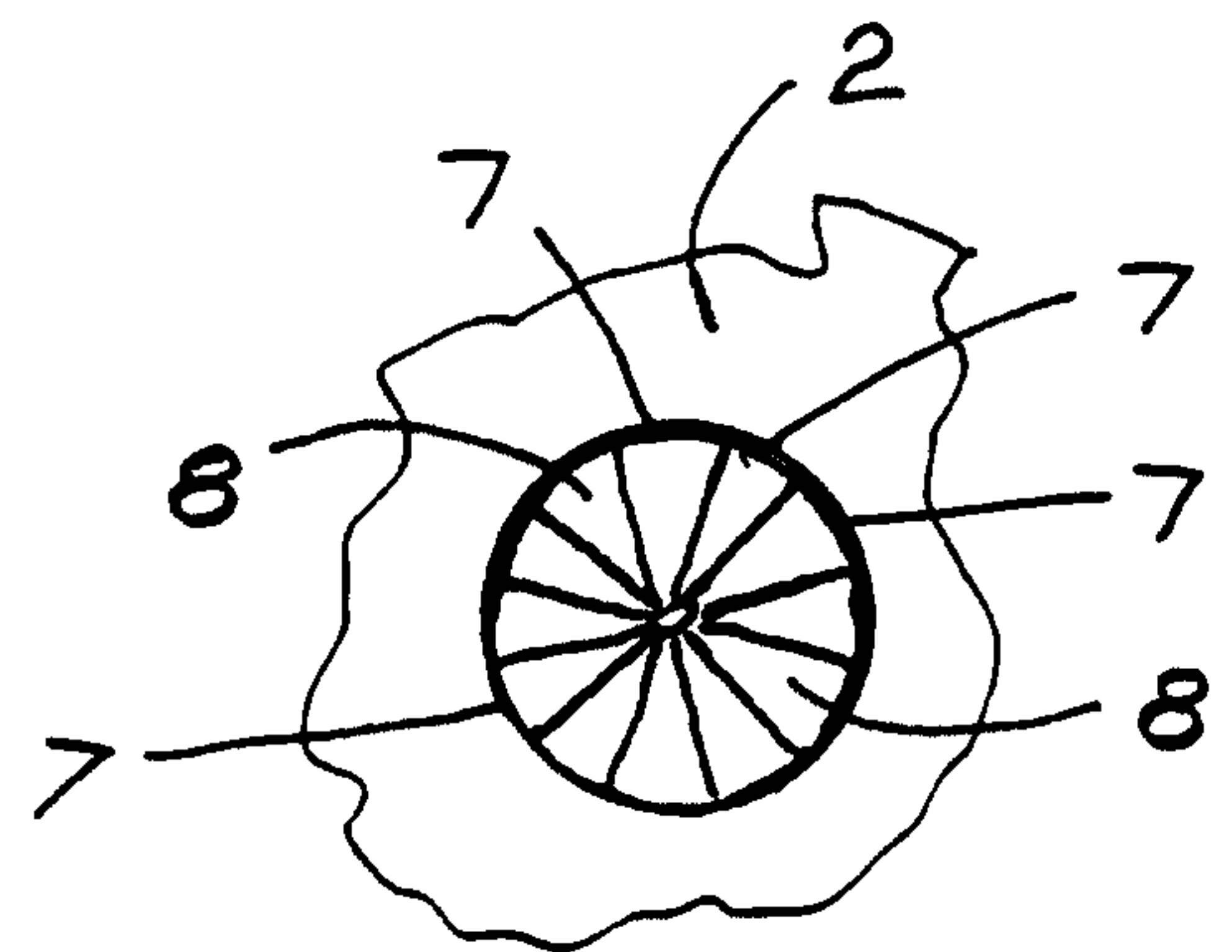


Fig. 2

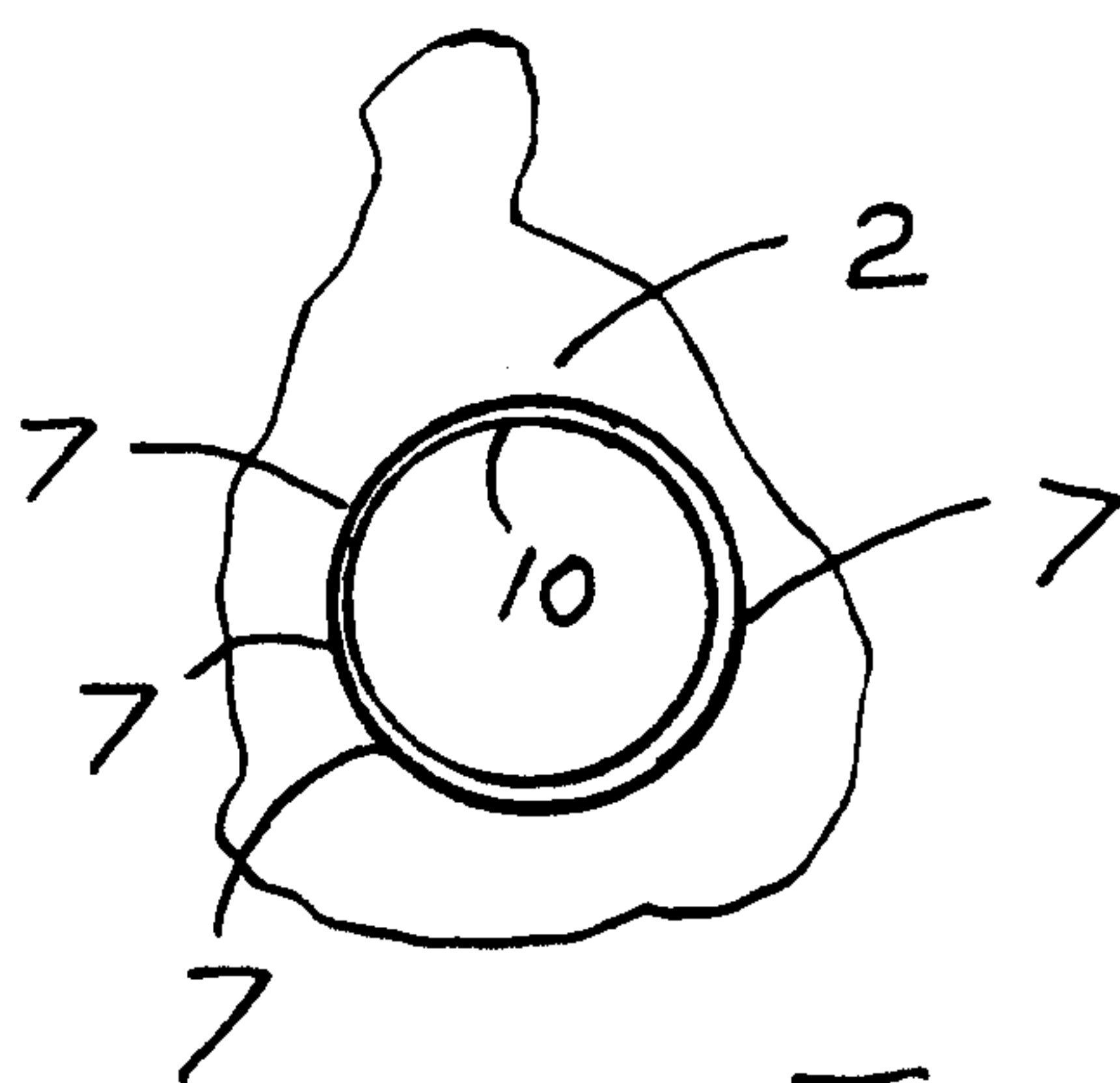
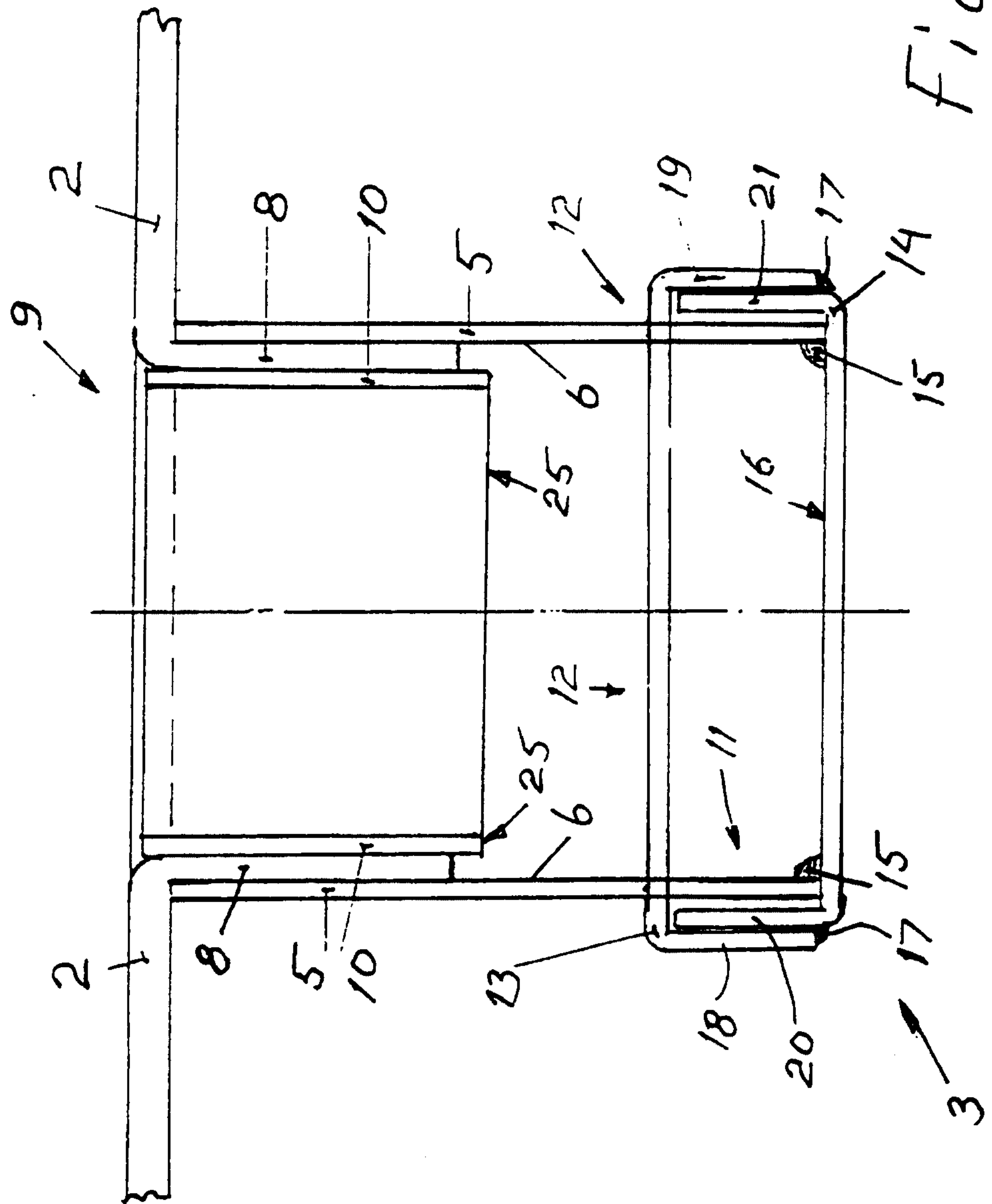


Fig. 3



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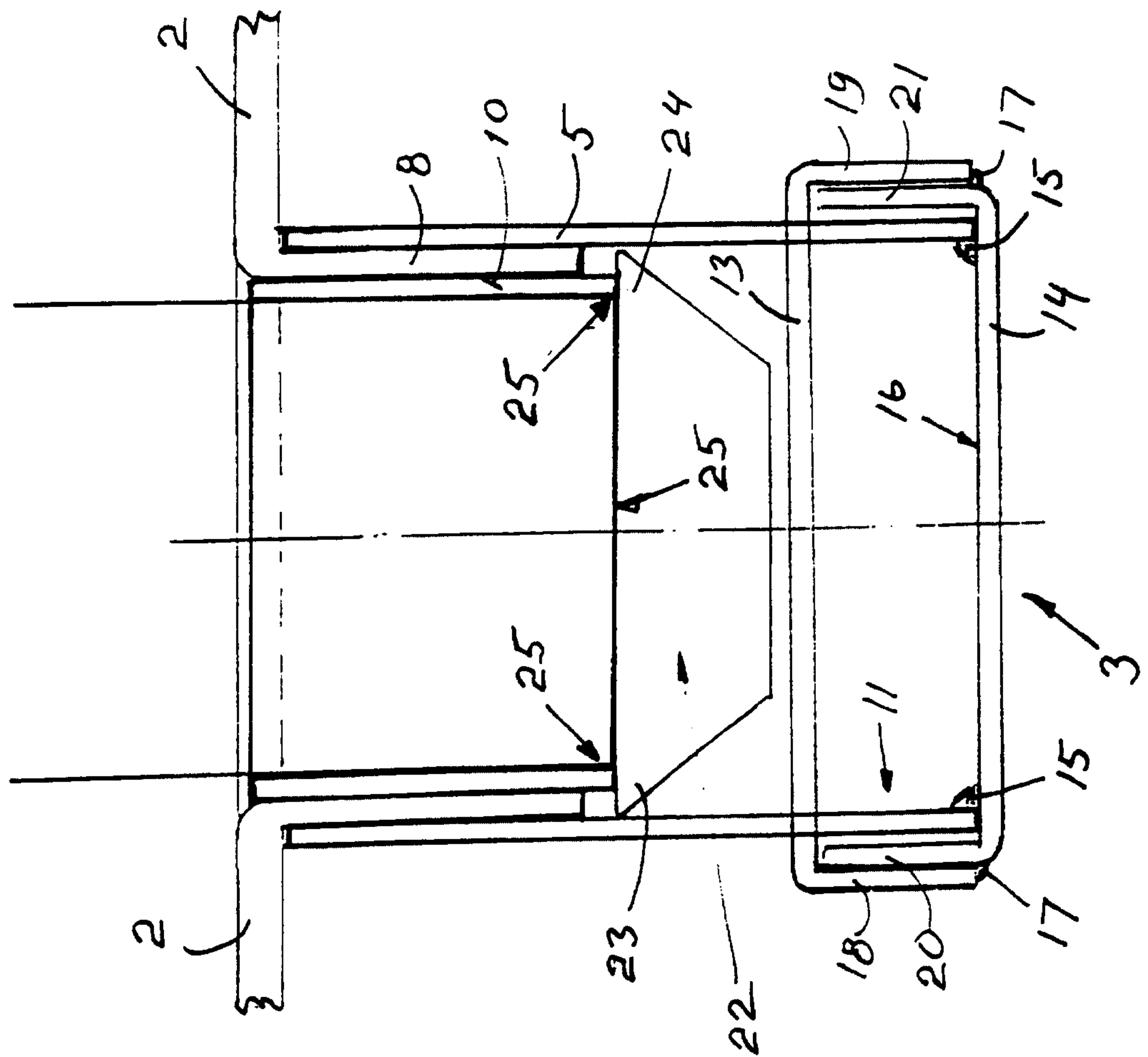


Fig. 5

