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

(11) EP 0 705 770 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
23.05.2001 Bulletin 2001/21

(51) Int Cl.[7]: **B65D 85/06**, B65D 19/44

(21) Application number: **95114987.1**

(22) Date of filing: **25.09.1995**

(54) **Container with self-locking arms, especially suitable for rolling stock**

Behälter mit selbstverrieglenden Armen, geeignet für die Lagerung von rollenden Gegenständen

Conteneur avec bras auto-verrouillables, adaptés au stockage d'objets roulants

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE LI LU MC NL PT SE
Designated Extension States:
LV SI

(30) Priority: **29.09.1994 IT BG940043**

(43) Date of publication of application:
10.04.1996 Bulletin 1996/15

(73) Proprietor: **LUCCHINI S.p.A.**
20121 Milano (IT)

(72) Inventor: **Tignonsini, Zaverio Egidio**
I-25047 Darfo Boario Terme (IT)

(74) Representative: **Lecce, Giovanni**
Studio Nord Brevetti,
Via Verdi, 14
24121 Bergamo (IT)

(56) References cited:
EP-A- 0 505 295
CH-A- 548 911
DE-U- 7 227 227

EP 0 705 770 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] This invention relates to a container with self-locking arms, especially suitable for rolling stock.

[0002] More particularly, this invention relates to a container with self-locking arms, for the packing, transportation and storing of rolling stock especially tyres of railroad cars, tyre-centres and monobloc wheels.

[0003] A device with self locking arms for receiving long objects according to the preamble of claim 1 is known from EP-A-0 505 295.

[0004] As is known, because of the volume and weight of the components, the handling of railroad wheel arrangement requires specific interventions, suitable to prevent damages following the accidental and frequent shiftings of the load. Especially in relation with tyres, tyre-centres and monobloc wheels of railroad cars, it is necessary to provide packings such as to ensure as much as possible the stability and compactness of the many grouped components, usually transported by sea or railroad shipping from the production plants to the different destinations.

[0005] For this purpose, said wheels, tyres and tyre-centres are superposed in variable number on pallets or beds of a traditional type and then steel strapped, i. e. tied to the supporting frame by means of metal straps. This traditional solution involves some severe drawbacks.

[0006] First of all, the steel straps utilized do not prevent the shifting of the superposed elements in case of abrupts strains which happen often during transportation; as a consequence, the superposed monobloc wheels, tyres and tyre-centres, tend to move away from one another in a disorderly way, and in the worst cases, they break the straps, sliding on the floor and suffering damages. Therefore, on unloading the material, it is necessary to re-compact the group of components, which is obviosuly difficult because of the weight, and time wasting.

[0007] Also in the stage of preparation of the bed for the shipment, the operation of arranging the whole involves marked difficulties, as wheels, tyres or tyre-centres must be superposed with a precise alignment, and therefore constrained by said steel straps.

[0008] Object of this invention is to obviate the aforementioned drawbacks.

[0009] More particularly, object of this invention is to provide a container for rolling stock such as not to require binding operations of the material, and allowing, during the transportation, the exact keeping of the original position even in case of abrupt strains.

[0010] A further object of the invention is to provide users with a container as defined above, suitable to automatically lock the rolling stock placed on the same.

[0011] A further object of the invention is to provide a container for rolling stock suitable to ensure a high level of resistance and reliability in the long run, and also such as to be easily and economically realizable.

[0012] According to the present invention, these and still further objects are achieved by a container with self-locking arms, particularly suitable for rolling stocks, comprising a metal frame made up by standards connected by cross-pieces and provided with lever arms articulatably connected to the frame and whose fulcrum is on the inner front of each of said standards, each arm being "L"-shaped and comprising a horizontal and a vertical branch, characterized in that the metal frame is provided with a lower and an upper cross-pieces and with two couples of "L"-shaped lever arms, the arms of one couple being articulatably connected to the corresponding ones of the other couple by respective ends of their horizontal branches and in that the lower ends of the vertical branches of the arms of each couple are connected by a connecting cross-piece provided at its ends with a protruding pins which fit in the corresponding inner front of standards.

[0013] Particular embodiments of the invention are set forth in dependent claims 2 to 10.

[0014] The construction and functional characteristics of the container with self-locking arms for rolling stock subject matter of this invention shall be better highlighted by the following detailed description of a preferred non limitative embodiment of the same, made with reference to the attached drawings, wherein:

Fig. 1 shows schematically a perspective view of the container with self-locking arms, subject matter of the invention;
Fig. 2 is a schematic front view of the container, limitedly to a couple of leverages and locking arms which act on the loaded elements;
Fig. 3 is a schematic side view of the container wherein the rolling stock is placed.

[0015] With starting reference to Fig. 1, the container with self-locking arms for rolling stock is basically constituted by a metal frame indicated on the whole by 10, having a hexagonal plan by way of example, made up by vertical standards 12 connected by cross-pieces 14, horizontally arranged near the floor supporting point of said standards. Further cross-pieces 16 connect, in the upper part, two couples of opposite standards 12. The aforementioned standards and cross-pieces, preferably made from quadrangular iron sections connected to one another by means of welding, circumscribe a container of a substantially parallelepipedal shape.

[0016] Frame 10 is provided with four metal lever arms 18, 18', connected in pairs, which circumscribe a toggle device developed in the inside of the frame. More particularly, each of the arms 18, 18' is constituted by a substantially "L"-shaped element from steel or other suitable material having a section quadrangular by way of example, connected to the internal wall of one of standards 12; the end of the horizontal branch of each arm 18, 18' is connected, with pins or bolts 20, to the corresponding end of the opposite arm by whose side it

rests. The aforementioned arms are placed in correspondence of the inner front of standards 12, which are not connected to one another on the top, and which develop preferably with their vertical branch from about mid-height of said standards until they almost reach standards 14.

[0017] Each couple of arms 18, 18' has a further connecting cross-piece 22, tied by welding or equivalent means to the lower end of the vertical branch of said arms. Said connecting element is parallel relatively to the underlying cross-piece 14 of frame 10, and is spaced from it by a length comprised, by way of example, between 15 and 30 mm. The opposite fronts of cross-piece 22 are provided with seats for fitting pins 28' or equivalent means for connecting to standard 12.

[0018] Between the vertical branches of each couple of arms 18, 18', a "U"-shaped metal frame 24 is located; the vertical branches 26 of said frame brush the inner front of arms 18, 18' in correspondence of their upper branch to which they are connected by means of bolts 28 or equivalent means. The vertical branches 26 of the same "U"-shaped frames have preferably a double length compared to the vertical branches of arms 18, 18', reaching a sligthly lower level compared with the upper end of standards 12; the horizontal branch 26' of said frames 24 is spaced by a length comprised, by way of example, between 20 and 40 mm from cross-piece 22 connecting arms 18, 18', in order to be able to oscillate freely relatively to the same.

[0019] Standards 12 and the horizontal branches of arms 18, 18' are preferably connected by elastic means (not shown), such as for instance springs or the like; said means allow, as stressed in particular in Fig. 1, to keep the horizontal branches of said arms angularly oriented upwards, in the absence of loads placed in frame 10. In these conditions, the vertical branches of arms 18, 18' may slighltly protrude towards the outside relatively to standards 12, as shown by the diagram of Fig. 1; however, a preferred solution provides for the arrangement of specific catches on the standards, to prevent arms from protruding from the same.

[0020] Altogether, arms 18, 18' constitute an oscillating support for the load to be placed in the container, made up by frame 10 and are stressed the moment the load rests on them, as we shall specify in detail in the following with reference to Figs. 2 and 3.

[0021] Fig. 2 shows schematically the arrangement assumed by a couple of arms 18, 18' and a "U"-shaped frame when rolling stock, for instance monobloc wheels 30 for railroad cars, are placed in the container subject matter of the invention. Said monobloc wheels, oriented with a vertical axis, are aligned to one another and arranged by groups in frame 10, transversally relatively to arms 18, 18', whose horizontal branches, under the action of the weight, are caused to lower in the direction of cross-pieces 14, overcoming the resistance of the springs or like elastic means which connect them to standards 12.

[0022] The lowering of the aforementioned branches is automatically limited by the whole length of the groups of monobloc wheels 30, whose number is comprised between 4 and 6, depending on their thickness; the external front of the first and last of them is actually directly catched by the vertical branches of arms 18, 18', which oscillate in the direction of the centre of frame 10.

[0023] The opposite "U"-shaped frames 24, articulatably connected in correspondence of the end of the vertical branches of said arms, oscillate in their turn in the same direction and approach the monobloc wheels, circumscribing their exposed front also in the upper portion, acting therefore as a restraining barrier. This condition is schematically shown in Fig. 3.

[0024] Said monobloc wheels are traditionally provided with a central hole 30', within which a temporary supporting shaft is advantageously provided; hence, a plurality of wheels 30 can be fitted on said shaft which, protruding from the opposite ends of the group of artifacts approached to one another, constitutes the suitable grip point for the whole of wheels which are simultaneously handled by hoists or lifting trucks, and placed blockwise in frame 10.

[0025] As can be understood from the above, the invention achieves many advantages.

[0026] The container with self-locking arms subject matter of this invention allows to group and keep in constant barycentric position the monobloc wheels, the tyres or the tyre-centres of railroad cars; the same container is advantageously utilizable during the working of said artifacts, acting as a small storehouse for temporary storing.

[0027] The material circumscribed by the arms and the "U"-shaped frames of the container is not subject to slidings and ensuing possible dents, and does not require further steel strapping operations.

[0028] The loaded containers are easily transportable, as the base cross-pieces are spaced from the supporting plane and allow the insertion of the forks of the lifting trucks.

[0029] However, the invention, as described hereabove and claimed hereafter has been proposed by way of example only, being understud that the same may be subject to many changes and variants, all of them falling within the scope of the invention.

[0030] For instance, the container may be provided, especially along the standards, with openings no matter how shaped for hooking ropes or chains allowing the handling with overhead cranes, or it may have supporting plates on the upper end of said standards or seats suitably shaped for their superimposition.

[0031] While it has been proposed in particular for the transportation of rolling stock, the container subject matter of the invention can be used also for other purposes, and house, for instance, with the suitable sizings, coiled metal strips or other artifacts and materials for which an exact locking is required during handling.

[0032] Lastly, possible structural reversals or alterna-

tive placings of the components which form altogether the container subject matter of the invention are also possible.

Claims

1. A container with self-locking arms, particularly suitable for rolling stocks, comprising a metal frame (10) made up by standards (12) connected by cross-pieces (14, 16) and provided with lever arms (18, 18') articulatably connected to the frame and whose fulcrum is on the inner front of each of said standards (12), each arm (18, 18') being "L"-shaped and comprising a horizontal and a vertical branch, characterized in that the metal frame (10) is provided with a lower (14) and an upper (16) cross-pieces and with two couples of "L"-shaped lever arms (18, 18'), the arms (18, 18') of one couple being articulatably connected to the corresponding ones of the other couple by respective ends of their horizontal branches and in that the lower ends of the vertical branches of the arms (18, 18') of each couple are connected by a connecting cross-piece (22) provided at its ends with a protruding pins (28') which fit in the corresponding inner front of standards (12).

2. The container according to claim 1, characterized in that the ends of the horizontal branches of the arms (18, 18') of one couple are articulatably connected to the corresponding ends of the opposite couple by pins or bolts (20).

3. The container according to claim 1 or 2, characterized in that the vertical branch of each arm (18, 18') develops from about mid-height of standards (12) up to almost the lower cross-piece (14).

4. The container according to anyone of the preceding claims, characterized in that the connecting cross-piece (22) is parallel to the lower cross-piece (14) and is spaced from it by a length comprised between 15 and 30 mm.

5. The container according to anyone of the preceding claims,
characterized in that a substantially "U"-shaped frame (24), comprising two vertical branches (26) and a horizontal branch (26'), is provided between the vertical branches of the arms (18, 18') of each couple, each vertical branch (26) is articulatably connected to and brushes the inner wall of said arms (18, 18').

6. The container according to claim 5, characterized in that the vertical branch (26) of the "U"-shaped frame (24) is connected to the inner wall of the arms (18, 18') by a bolt (28).

7. The container according to claim 5 or 6, characterized in that the vertical branches (26) of each "U"-shaped frame (24) have a lenght almost twice the lenght of the vertical branches of the arms (18, 18').

8. The container according to anyone of the preceding claims from 5 to 7, characterized in that the horizontal branch (26') of each "U"-shaped frame (24) is spaced from the connecting cross-piece (22) to freely oscillate.

9. The container according to claim 8, characterized in that the horizontal branch (26') of each "U"-shaped frame (24) is spaced from the connecting cross-piece (22) by a lenght comprised between 20 and 40 mm.

10. The container according to anyone of the preceding claims, characterized in that the standards (12) are connected to the corresponding horizontal branches of the arms (18, 18') by elastic means to keep said branches angularly oriented upwards, in absence of loads.

Patentansprüche

1. Behälter mit selbstsperrenden Armen, insbesondere verwendbar für rollende Güter, umfassend einen Metallrahmen (10), der aus Ständern (12) zusammengesetzt ist, die durch Querstücke (14, 16) verbunden und mit Hebelarmen (18, 18') versehen sind, die gelenkig mit dem Rahmen verbunden sind und deren Hebelstütze auf der inneren Front jedes Ständers (12) ist, wobei jeder Arm (18, 18') "L"-förmig ist und einen horizontalen und einen vertikalen Zweig umfaßt, dadurch gekennzeichnet, daß der Metallrahmen (10) mit unteren (14) und oberen (16) Querstücken und zwei Paaren von "L"-formigen Hebelarmen (18, 18') versehen ist, wobei die Arme (18, 18') eines Paares gelenkig an den entsprechenden Armen des anderen Paares durch jeweilige Enden ihrer horizontalen Zweige verbunden sind und dadurch, daß die unteren Enden der vertikalen Zweige der Arme (18, 18') jedes Paares durch ein verbindendes Querstück (22) verbunden sind, das an seinen Enden mit einem vorstehenden Stift (28') versehen ist, welcher in die entsprechende innere Front der Ständer (12) paßt.

2. Behälter nach Anspruch 1, dadurch gekennzeichnet, daß die Enden der horizontalen Zweige der Arme (18, 18') eines Paares gelenkig mit den entsprechenden Enden des gegenüberliegenden Paares durch Stifte oder Bolzen (20) verbunden sind.

3. Behälter nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß sich der vertikale Zweig jedes Armes

(18, 18') von etwa mittlerer Höhe der Ständer (12) bis fast zu dem unteren Querstück (14) ausbildet.

4. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das verbindende Querstück (22) parallel zu dem unteren Querstück (14) ist und von diesem durch eine Länge beabstandet ist, die zwischen 15 und 30 mm umfaßt.

5. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß ein im wesentlichen "U"-förmiger Rahmen (24), der zwei vertikale Zweige (26) und einen horizontalen Zweig (26') umfaßt, zwischen den vertikalen Zweigen der Arme (18, 18') jedes Paares vorgesehen ist, wobei jeder vertikale Zweig (26) gelenkig mit der inneren Wand der Arme (18, 18') verbunden ist und diese überstreicht.

6. Behälter nach Anspruch 5, dadurch gekennzeichnet, daß der vertikale Zweig (26) des "U"-förmigen Rahmens (24) mit der inneren Wand der Arme (18, 18') durch einen Bolzen (28) verbunden ist.

7. Behälter nach Anspruch 5 oder 6, dadurch gekennzeichnet, daß die vertikalen Zweige (26) jedes "U"-förmigen Rahmens (24) eine Länge haben, die fast die doppelte Länge der vertikalen Zweige der Arme (18, 18') ist.

8. Behälter nach einem der vorhergehenden Ansprüche 5 bis 7, dadurch gekennzeichnet, daß der horizontale Zweig (26') jedes "U"-förmigen Rahmens (24) von dem verbindenden Querstück (22) beabstandet ist, um frei zu schwingen.

9. Behälter nach Anspruch 8, dadurch gekennzeichnet, daß der horizontale Zweig (26') jedes "U"-förmigen Rahmens (24) von dem verbindenden Querstück (22) durch eine Länge beabstandet ist, die zwischen 20 und 40mm umfaßt.

10. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Ständer (12) mit den entsprechenden horizontalen Zweigen der Arme (18, 18') durch elastische Elemente verbunden sind, um die Zweige, bei Abwesenheit von Lasten, winkelig nach oben orientiert zu halten.

Revendications

1. Conteneur à bras auto-bloquants, convenant en particulier à du matériel roulant, comportant un châssis métallique (10) formé par des montants (12) reliés par des traverses (14, 16), et pourvu de bras de levier (18, 18'), reliés de façon articulée au châssis, et dont le point d'appui est situé sur le côté avant intérieur de chacun desdits montants (12), chaque bras (18, 18') ayant la forme d'un "L" et comportant une branche horizontale et une branche verticale, caractérisé en ce que le châssis métallique (10) est pourvu de traverses inférieure (14) et supérieure (16) et de deux couples de bras de levier (18, 18') en forme de "L", les bras (18, 18') d'un couple étant reliés de façon articulée aux bras correspondants de l'autre couple par des extrémités respectives de leurs branches horizontales, et en ce que les extrémités inférieures des branches verticales des bras (18, 18') de chaque couple sont reliées par une traverse (22) de liaison pourvue, à ses extrémités, de broches en saillie (28') qui s'ajustent dans le côté avant intérieur correspondant des montants (12).

2. Conteneur selon la revendication 1, caractérisé en ce que les extrémités des branches horizontales des bras (18, 18') d'un couple sont reliées de façon articulée aux extrémités correspondantes du couple opposé par des broches ou des boulons (20).

3. Conteneur selon la revendication 1 ou 2, caractérisé en ce que la branche verticale de chaque bras (18, 18') se développe depuis approximativement la mi-hauteur des montants (12) jusqu'à presque la traverse inférieure (14).

4. Conteneur selon l'une quelconque des revendications précédentes, caractérisé en ce que la traverse (22) de liaison est parallèle à la traverse inférieure (14), et en est espacée d'une longueur comprise entre 15 et 30 mm.

5. Conteneur selon l'une quelconque des revendications précédentes, caractérisé en ce qu'un cadre (24) sensiblement en forme de "U", comportant deux branches verticales (26) et une branche horizontale (26') est prévu entre les branches verticales des bras (18, 18') de chaque couple, chaque branche verticale (26) étant reliée de façon articulée à la paroi intérieure desdits bras (18, 18') et l'effleurant.

6. Conteneur selon la revendication 5, caractérisé en ce que la branche verticale (26) du cadre (24) en forme de "U" est reliée à la paroi intérieure des bras (18, 18') par un boulon (28).

7. Conteneur selon la revendication 5 ou 6, caractérisé en ce que les branches verticales (26) de chaque cadre (24) en forme de "U" ont une longueur presque double de la longueur des branches verticales des bras (18, 18').

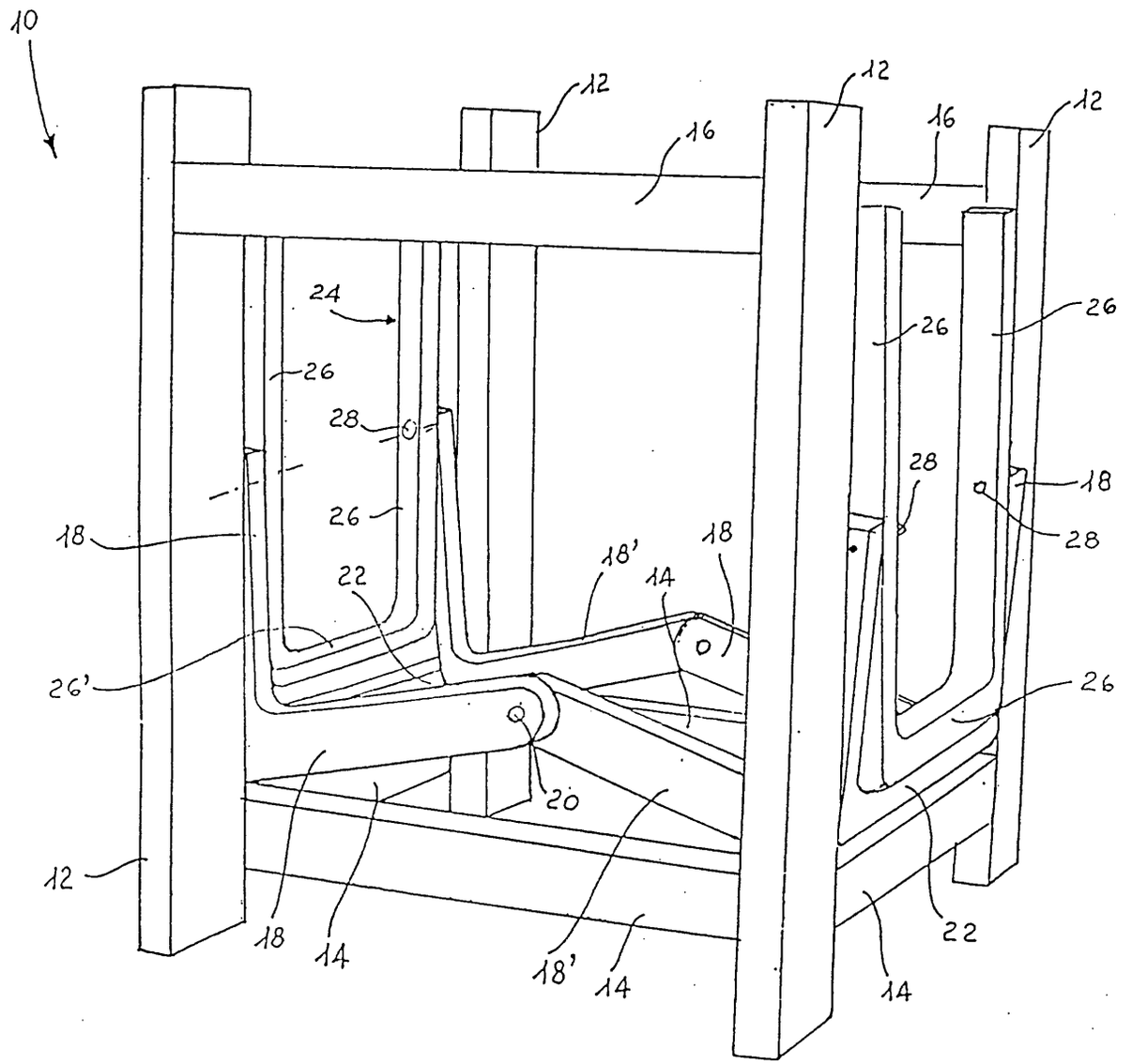
8. Conteneur selon l'une quelconque des revendications précédentes 5 à 7, caractérisé en ce que la

branche horizontale (26') de chaque cadre (24) en forme de "U" est espacée de la traverse de liaison (22) de façon à osciller librement.

9. Conteneur selon la revendication 8, caractérisé en ce que la branche horizontale (26') de chaque cadre (24) en forme de "U" est espacée de la traverse de liaison (22), d'une longueur comprise entre 20 et 40 mm.

10. Conteneur selon l'une quelconque des revendications précédentes, caractérisé en ce que les montants (12) sont reliés aux branches horizontales correspondantes des bras (18, 18') par des moyens élastiques pour maintenir lesdites branches orientées angulairement vers le haut, en l'absence de charges.

FIG. 1



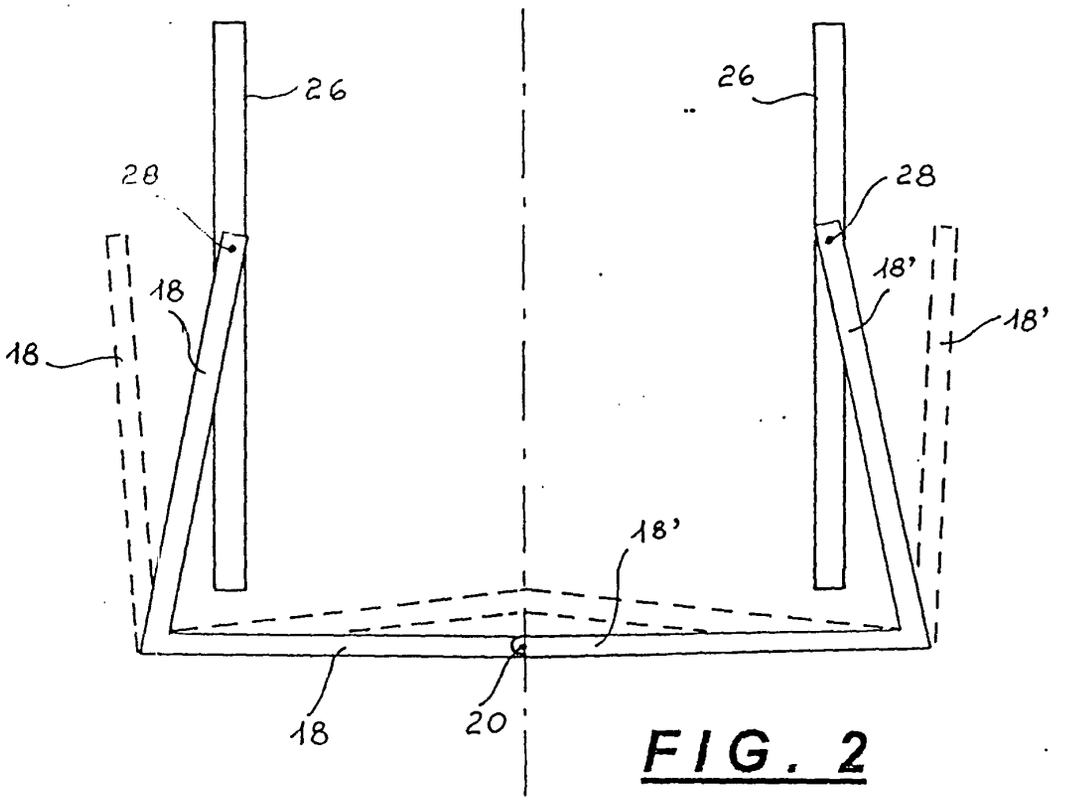

26
26
28
28
18
18
18'
18'
18'
18
20

FIG. 2

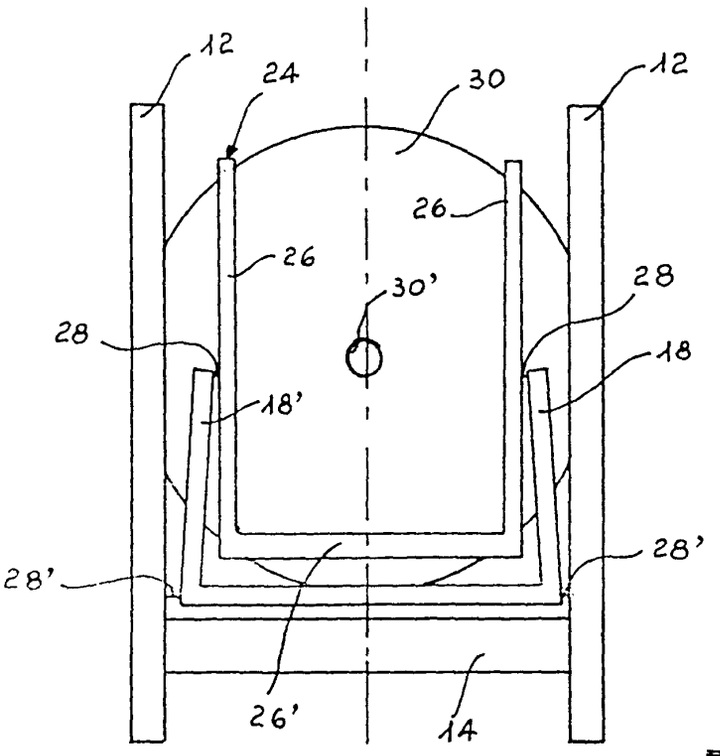

12
24
30
12
26
26
30'
28
28
18
18'
28'
28'
26'
14

FIG. 3