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(54) **A bucket, or in general a container, for transporter vehicles, having a variable-shape transversal section**

Eine Schaufel, oder im allgemeinen ein Behälter, für Transportfahrzeuge, mit einem in Querrichtung veränderbaren Profil.

Un godet, ou en général un conteneur, pour véhicules de transport, ayant un profil transversal de section variable.

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EP 1 473 416 B1

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Description

[0001] The invention refers to a bucket which is associated to a machine used for the transport of loose materials.

[0002] Specifically, though not exclusively, the invention is usefully applied in the realisation of buckets with an optimised distribution of the weight carried.

[0003] Buckets at present used for movement of loose materials exhibit, as is known, a U-shaped transversal section, more or less open, which is of dimensions that are equal to the width of the vehicle to which the bucket is associated.

[0004] The attachment points of the support arms and the actuators used for the rotation of the bucket about a horizontal axis thereof are located along the external posterior profile of the bucket. Thus all the useful volume of the bucket is situated projectingly in relation to the attachment points, which necessitates the use of larger support arms and actuators, leading to a certain degree of overall instability of the machine or vehicle.

[0005] This arrangement and configuration also leads to a large overall size of the vehicle and bucket, with a certain restriction of the operator's field of view.

[0006] DE-B1-1158447 shows a bucket associated to a machine, wherein a transversal section of the bucket has a variable profile in order to create therein distinct sections distributed internally of the bucket.

[0007] US-3369680 shows a bucket which has re-entrant chambers in its rear wall to enable forward positioning of the bucket lift arms.

[0008] The main aim of the present invention is to provide a bucket which can overcome the above-described drawbacks.

[0009] A further aim is to provide a bucket which can be associated to machines of various types, optimising the distribution of the weight of the transported material with respect to the vehicle.

[0010] The above aims and more besides are attained by a bucket, according to claim 1. Such bucket can be associated to machine vehicles of various kinds and comprises a transversal section having a variable profile in order to create different volumes of material distributed internally of the bucket. In particular, the distribution of the volumes is such that the resulting centre of gravity of the material in the bucket is located at the axis of the points of attachment of the bucket to the support arms of the vehicle.

[0011] The configuration of the profile of the bucket advantageously includes a central zone having a small transversal section and two lateral zones having larger sections, the points of attachment of the bucket to the support arms being located in the central zone.

[0012] The buckets applicable to the present invention can be of various types, for example, tipping buckets, side-tipping buckets, grid buckets, spades or grab-buckets, and more besides.

[0013] The machine the bucket or other container is

attached to may be of different types, for example, rubber-wheeled, tracked, diggers or tampers, or others besides.

[0014] The characteristics as above described clearly demonstrate the advantages of the invention with respect to prior-art devices, particular advantages being the overall stability and compactness of the machine equipped with the bucket or other container, the improved stability deriving from the fact that the centre of gravity of the transported load is displaced into a position which is much closer to the machine.

[0015] Further advantages of the invention will better emerge from the detailed description that follows, of a preferred but not exclusive realisation of the invention, illustrated purely by way of non-limiting example in the figures of the drawings, in which:

figure 1 is a perspective view of a bucket according to the invention;

figure 2 is a further perspective view of the bucket of the invention;

figure 3 is a profile section of the bucket of figure 1; figure 4 is an overall perspective view of the bucket of figure 1 and the relative support arms and actuators.

[0016] With reference to figure 1, 10 denotes in its entirety a container according to the invention, which in the preferred embodiment is a bucket.

[0017] Figure 1 shows that the profile of the transversal section comprised between the two sides 11, 12 of the bucket 10 is not constant, but varies in order to generate three distinct contiguous sections. Two of the sections 13 and 14 are of the same dimensions and are arranged laterally to a central third section 15 which is smaller. The profile of the central section 15 is clearly visible in figure 3, where a transversal section of the bucket is shown, obtained according to section plane 20 of figure 1.

[0018] Figure 3 also shows the points of attachment 16, 17 on the bucket, respectively of a support arm 18 and a hydraulic cylinder 19. A further point of attachment 21, of a second support arm 22, is visible in figure 2 where it is shown that the points of attachment 16, 17, 19 are made using sheet steel sections 23, 24, 25 anchored to the posterior surface 26 of the central section 15. The points of attachment 16, 21 of the support arms 18, 22 are afforded between the sectors 23, 24 and the internal side plates 27, 28 of the side sections 13, 14, while the point of attachment 17 of the hydraulic cylinder 19 is afforded between two contiguous sheet steel sections 25.

[0019] At an end of the side plates 27, 28 and the lateral sections two protuberances 29 are fashioned which enable a hooking-up of the bucket 10 in order that it can be moved.

[0020] The conformation of the lateral sections 13, 14 is such that each of them exhibits a concavity 31 having a semicircular shape and facing externalwards. When the bucket is oriented upwards, the concavities 31 of the

lateral sections are arranged by the two front tyres of the vehicle and help to reduce the overall size of the vehicle-bucket assembly.

[0021] The operation of the above-described bucket will now be described. Looking at figure 3 in particular, with the bucket of the invention the overall centre of gravity of the transported load is located much closer to the posterior part of the bucket with respect to traditional buckets. Also, an axis passing through the points of attachment 16 to the support arms is located internally of the transversal perimeter of the bucket and is therefore in a very close position to the centre of gravity.

[0022] Two advantages derive from this, which are connected with the greater manoeuvrability and the advantages connected with the lower structural stress of the support arms and the bucket control.

[0023] Displacing the overall centre of gravity of the bucket backwards, towards the vehicle, produces an improvement in the manoeuvrability of both vehicle and bucket, thanks also to the better view enjoyed by the operator.

[0024] The nearing of the axis of the points of attachment of the bucket to the support arms and the centre of gravity of the bucket considerably reduces the reaction torque when the bucket is rotated between the various work positions.

[0025] The above advantages are preserved even where modifications and variants are applied to the above-described embodiment.

[0026] The profile of the bucket can certainly be varied with respect to the one illustrated in the preferred embodiment, and as a consequence the number and distribution of the internal sections of the bucket can also be varied.

[0027] The points of attachment of the bucket or container to the support arms can obviously be differently located along the external surface of the bucket.

[0028] The external conformation of the various sections the bucket is made up of can be varied in relation to the specific application and type of the bucket or container of the invention.

[0029] In particular, the invention is advantageously applicable to high-tilting buckets where the small tilting frame this type of bucket is equipped with is at least partially housable internally of the profile of the bucket itself.

[0030] In this case the distribution of the sections of the buckets is such that the resulting centre of gravity of the material in the bucket is located in proximity of the zone in which the tilting frame associated to the bucket is located.

Claims

1. A bucket (10) associated to a machine, in which a transversal section of the bucket has a variable profile in order to create therein distinct sections (13, 14, 15) distributed internally of the bucket (10); and

in which

the distribution of the sections (13, 14, 15) is such that a resulting centre of gravity of a material contained in the bucket (10) is located in proximity of an axis of points of attachment (16, 21) of the bucket (10) to support arms (18, 22) of the machine to which the bucket (10) is attached

or the distribution of the sections (13, 14, 15) is being such that the resulting centre of gravity of the material contained in the sections of the bucket is located in proximity of an axis of a zone in which a tilting frame of the bucket (10) associated to the bucket (10) is located;

and in which a configuration of a profile of the bucket (10) producing a central section (15) of the bucket which has a section smaller in width than two lateral sections (13, 14) thereof; the points of attachment (16, 21) of the bucket (10) to the support arms (18, 22) of the machine being located at the central section (15);

characterised in that the points of attachment (16, 21) of the bucket (10) to the support arms (18, 22) are being located between first sheet steel sectors (23, 24) anchored to an external surface (26) of the central section (15) and internal side plates (27, 28) of the lateral sections (13, 14) of the bucket (10); and **in that** a point of attachment (17) of a hydraulic cylinder (19) destined to rotate the bucket (10) is located between two contiguous second sheet steel sectors (25) anchored to the external surface (26) of the central section (15).

2. The bucket of claims 1, **characterised in that** a arrangement of the lateral sections (13, 14) of the bucket (10) include for each thereof a concavity (31) having a semicircular profile (31) facing externalwards, so that when the bucket (10) is oriented in an upwards direction each concavity (31) is arranged at a position close to a front tyre of the machine to which the bucket (10) is associated.
3. The bucket (10) of any one of the preceding claims, **characterised in that** the bucket (10) is a high-tilting bucket, or a side-tipping bucket, or a skeleton bucket, or a spade, or a bucket of another type.
4. A working vehicle comprising a bucket (10) of any one of the preceding claims, **characterised in that** said working vehicle is a rubber-wheeled vehicle.
5. A working vehicle comprising a bucket (10) of any one of claims from 1 to 7, **characterised in that** said working vehicle is a tracked vehicle.

Patentansprüche

1. Schaufel (10), zugeordnet einer Maschine, bei wel-

- cher der Querschnitt der Schaufel ein veränderbares Profil hat, um darin unterschiedliche Abschnitte (13, 14, 15) herzustellen, die im Inneren der Schaufel (10) verteilt sind; und bei welcher die Verteilung der Abschnitte (13, 14, 15) eine solche ist, dass ein sich ergebender Schwerpunkt eines in der Schaufel (10) enthaltenen Materials in der Nähe der Achse der Befestigungspunkte (16, 21) der Schaufel (10) an den Trägerarmen (18, 22) der Maschine angeordnet ist, an welcher die Schaufel (10) angebracht ist, oder wobei die Verteilung der Abschnitte (13, 14, 15) eine solche ist, dass der sich ergebende Schwerpunkt des in der Schaufel enthaltenen Materials in der Nähe einer Achse eines Bereiches angeordnet ist, in welchem sich ein der Schaufel (10) zugeordneter Kipprahmen befindet; und bei welcher eine Konfiguration des Profils der Schaufel (10) einen mittleren Abschnitt (15) der Schaufel bildet, welcher einen schmaleren Querschnitt in der Breite hat als die beiden seitlichen Abschnitte (13, 14) derselben; wobei die Befestigungspunkte (16, 21) der Schaufel (10) an den Trägerarmen (18, 22) der Maschine an dem mittleren Abschnitt (15) angeordnet sind; **dadurch gekennzeichnet, dass** die Befestigungspunkte (16, 21) der Schaufel (10) an dem Trägerarmen (18, 22) zwischen ersten Stahlblechteilen (23, 24), verankert an einer äusseren Oberfläche (26) des mittleren Abschnittes (15), und Seitenplatten (27, 28) der seitlichen Abschnitte (13, 14) der Schaufel (10) angeordnet sind; und **dadurch**, dass ein Befestigungspunkt (17) eines Hydraulikzylinders (19), dazu bestimmt, die Schaufel (10) zu drehen, zwischen zwei aneinandergrenzenden zweiten Stahlblechteilen (25) angeordnet ist, verankert an der äusseren Oberfläche (26) des mittleren Abschnittes (15). -
2. Schaufel nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die Ausbildung der seitlichen Abschnitte (13, 14) der Schaufel (10) für jeden derselben eine Vertiefung (31) mit einem nach aussen gerichteten halbkreisförmigen Profil (31) beinhaltet, so dass, wenn die Schaufel (10) nach oben gerichtet ist, sich jede Vertiefung (31) in einer Position dicht an den vorderen Reifen der Maschine angeordnet befindet, welcher die Schaufel (10) zugeordnet ist.
 3. Schaufel (10) nach einem beliebigen der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** die Schaufel (10) ein Typ von hohem Kippgrad, oder auch vom Typ mit seitlichem Kippen oder vom Typ mit Gitter oder vom Spatentyp oder von einem anderen Typ ist.
 4. Arbeitsfahrzeug, enthaltend eine Schaufel (10) nach einem beliebigen der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** das genannte Arbeitsfahrzeug ein Fahrzeug mit gummibereiften Rädern ist.
 5. Arbeitsfahrzeug, enthaltend eine Schaufel (10) nach einem beliebigen der vorstehenden Patentansprüche von 1 bis 7, **dadurch gekennzeichnet, dass** das genannte Arbeitsfahrzeug ein Raupenfahrzeug ist.
- ### Revendications
1. Godet (10) associé à une machine, dans lequel une section transversale du godet présente un profil variable de manière à créer en son intérieur des sections distinctes (13, 14, 15) distribuées à l'intérieur du godet (10); et dans lequel la distribution des sections (13, 14, 15) est telle qu'un centre de gravité résultant du matériau contenu dans le godet (10) est situé à proximité d'un axe de points d'attache (16, 21) du godet (10) à des bras de support (18, 22) de la machine à laquelle le godet (10) est associé, ou la distribution des sections (13, 14, 15) est telle que le centre de gravité résultant du matériau contenu dans les sections du godet est situé à proximité d'un axe d'une zone dans laquelle un châssis de renversement du godet (10) associé au godet (10) est situé; et dans lequel une configuration d'un profil du godet (10) produisant une section centrale (15) du godet ayant une section inférieure en largeur par rapport à ses deux sections latérales (13, 14); les points d'attache (16, 21) du godet (10) aux bras de support (18, 22) de la machine étant situés sur la section centrale (15); **caractérisé en ce que** les points d'attache (16, 21) du godet (10) aux bras de support (18, 22) sont situés entre de premiers secteurs en plaque d'acier (23, 24) ancrés sur une surface externe (26) de la section centrale (15) et des plaques latérales (27, 28) des sections latérales (13, 14) du godet (10); et **en ce qu'**un point d'attache (17) d'un vérin hydraulique (19) destiné à faire pivoter le godet (10) est situé entre deux seconds secteurs en plaque d'acier (25) contigus ancrés à la surface externe (26) de la section centrale (15).
 2. Godet selon la revendication 1, **caractérisé en ce qu'**une disposition des sections latérales (13, 14) du godet (10) comprend pour chacun d'entre eux une concavité (31) pourvue d'un profil semi-circulaire (31) orienté vers l'extérieur, de manière à ce que lorsque le godet (10) est orienté dans une direction vers le haut, chaque concavité (31) est disposée dans une position proche d'un pneu antérieur de la machine à laquelle le godet (10) est associé.
 3. Godet (10) selon n'importe laquelle des revendications précédentes, **caractérisé en ce que** le godet (10) est un godet à renversement élevé, un godet à déchargement latéral, ou à grille, à palette, ou un godet d'un autre type.

4. Véhicule de travail comprenant un godet (10) selon n'importe laquelle des revendications précédentes, **caractérisé en ce que** ledit véhicule de travail est un véhicule à roues en caoutchouc.

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5. Véhicule de travail comprenant un godet (10) selon n'importe laquelle des revendications 1 à 7, **caractérisé en ce que** ledit véhicule de travail est un véhicule à chenilles.

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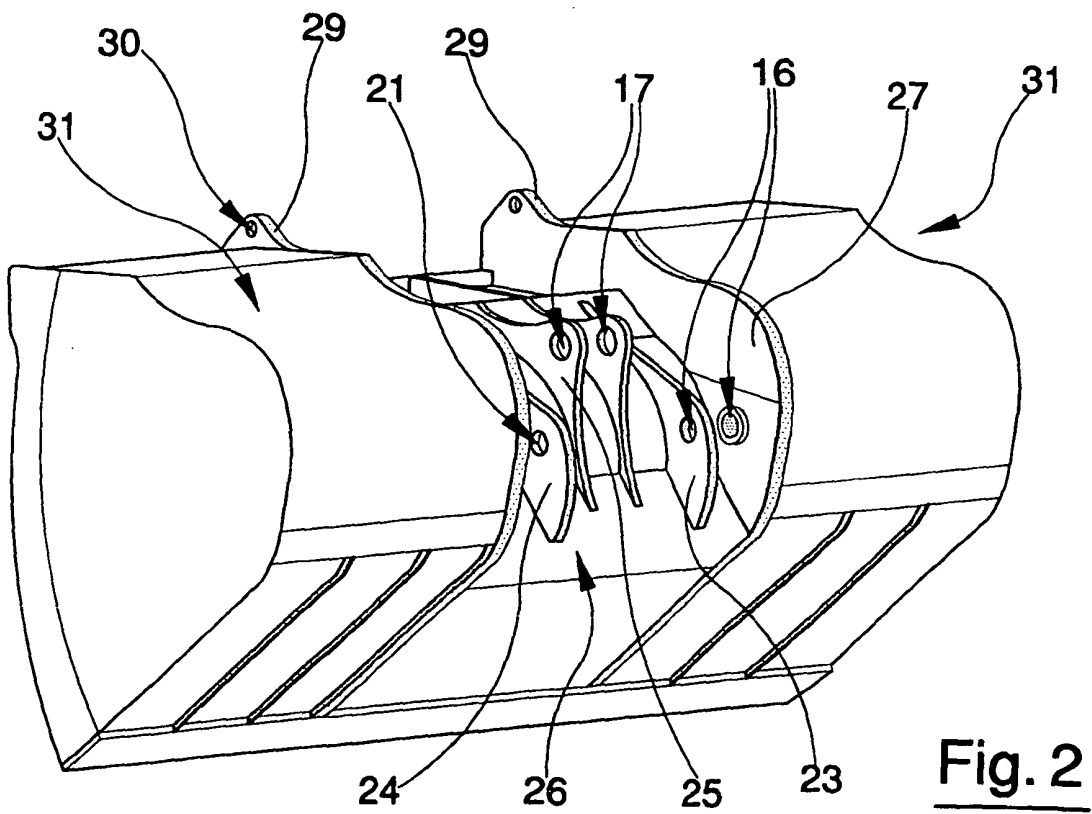
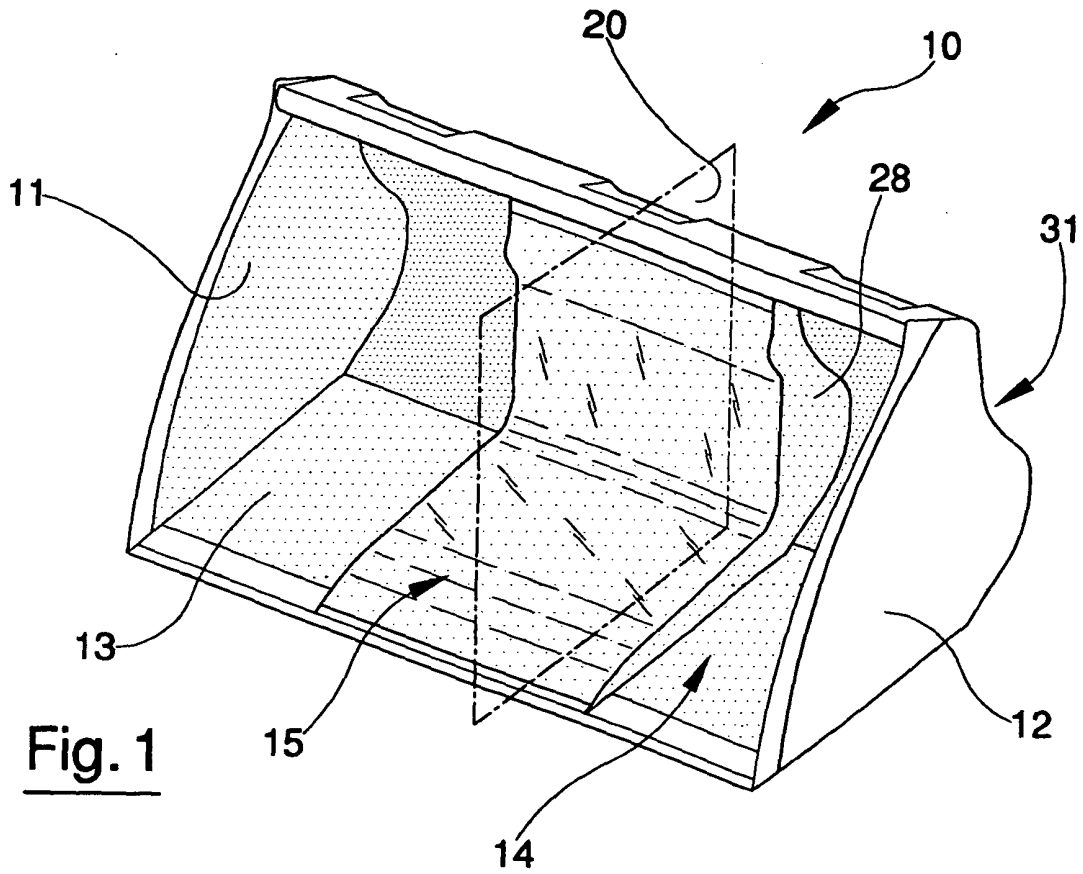


Fig. 3

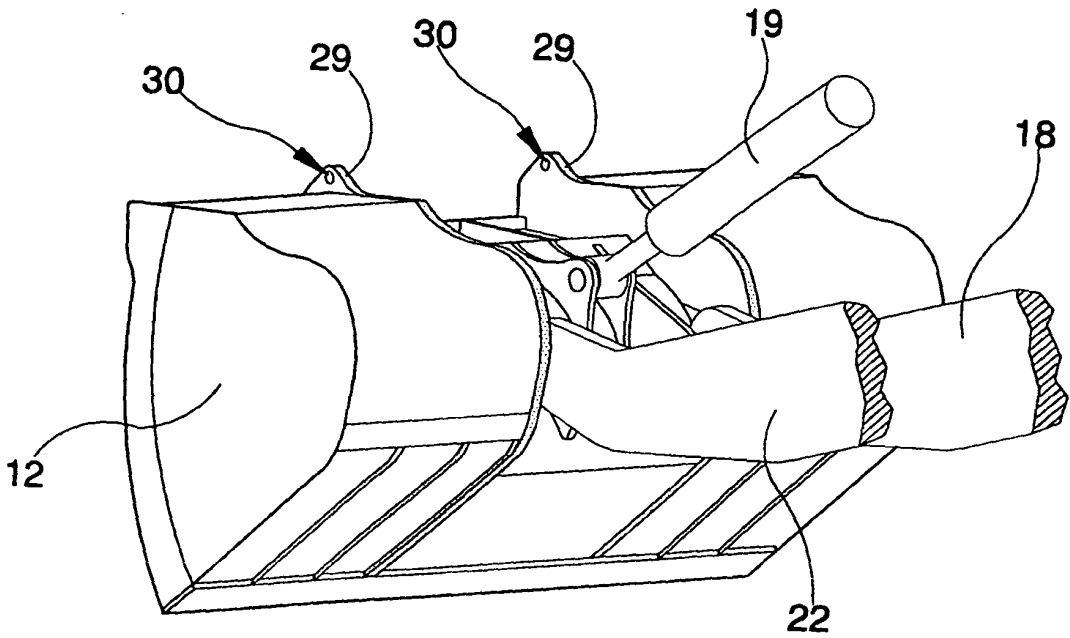
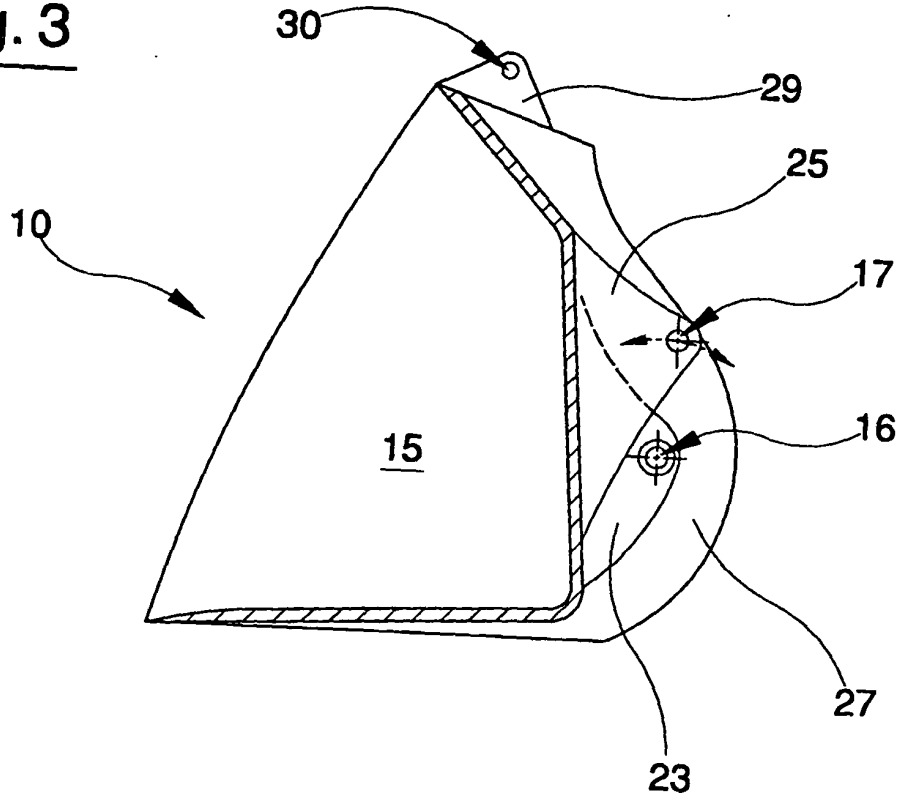


Fig. 4