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(54) **MULTI-COMPARTMENT DRUM**

MEHRKAMMERFASS

FUT DE STOCKAGE A COMPARTIMENTS MULTIPLES

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(56) References cited:
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Description

[0001] This invention is related to the field of storage drums. DE 43 05 340 describes a combined unit of plastic bottles which has several bottles each detachably joined to closable outlet and tongue-and-groove connections moulded into the sides. In preferred forms, the present invention is embodied in a storage drum having multiple storage compartments which allow at least two dissimilar materials (e.g. liquids, particulate solid materials, slurries or the like) to be stored separately of one another in respective ones of the compartments but be readily available for collective use (e.g., as a mixture of such materials).

[0002] It is sometimes desirable or necessary to supply pourable dissimilar materials (e.g., liquids, particulate solids and the like) separately to the end user even though the end user may wish to use such dissimilar materials as a mixture. For example, certain chemically and/or functionally dissimilar agricultural chemicals are desirably applied to crops as an admixture so as to improve application efficiency and/or chemical efficiency. However, it is sometimes impossible to supply such agricultural chemicals to the end user in premixed batches due to chemical instability of the mixture and/or government environmental/occupational safety requirements.

[0003] It would therefore be desirable if dissimilar materials which cannot physically be stored in admixture could nonetheless be contained separately in a common storage drum so that the end user could readily dispense such materials as needed. It is toward providing such a storage drum that the present invention is directed.

[0004] In general, the present invention is embodied in a longitudinally bisected storage drum composed of a pair of hemi-cylindrical drum segments. Thus, each drum segment will be formed by a pair of semicircular end panels which are joined to, and spaced-apart by, a side wall having a hemi-cylindrical wall section and a substantially rectangular planar wall section. The planar wall section of one drum segment (the female drum segment) will, moreover, define a longitudinally oriented re-entrant groove which unites with a longitudinally oriented tongue protruding from the planar wall section of the other drum segment (the male drum segment). Therefore, when the tongue and groove are united with one another, an overall cylindrical drum structure will result.

[0005] The closely adjacent planar wall sections of each drum segment establish a diametrical parting plane when the tongue and groove are united with one another. The hemicylindrical wall segments are provided with longitudinally spaced-apart and outwardly protruding pairs of roll stops close to this parting plane. The upper semicircular end panels are each provided with a bunghole formed in relationship to the roll stops such that, when the drum structure is turned on its side

and prevented from rolling by one set of roll stops, the bungholes will be substantially vertically oriented with respect to one another.

[0006] Thus, by simply reversing the vertical orientation of the bung-holes (e.g., by rolling the drum along its cylindrical side wall until the it rests upon the other set of roll stops), the contents within the hemi-cylindrical drum segments can selectively be dispensed by positioning that segment's bunghole in the lower vertical position relative to the other bunghole.

[0007] Other aspects and advantages of this invention will become more clear after careful consideration is given to the detailed description of the preferred exemplary embodiments thereof which follow.

[0008] Reference will hereinafter be made to the accompanying drawings wherein like reference numerals throughout the various FIGURES denote like structural elements and wherein;

FIGURE 1 is a front perspective view of the multi-compartment drum according to this invention;

FIGURE 2 is a top plan view of the multi-compartment drum shown in FIGURE 1;

FIGURE 3 is a bottom plan view of the multi-compartment drum of this invention shown in FIGURE 1;

FIGURE 4 is a front side elevational view of the multi-compartment drum of this invention as taken along lines 4-4 in FIGURE 2;

FIGURE 5 is a left side elevational view of the multi-compartment drum of this invention as taken along lines 5-5 in FIGURE 2;

FIGURE 6 is an exploded perspective view of the multicompartiment drum according to this invention showing the respective matable drum segments thereof separated in a clam-shell fashion;

FIGURE 7 is a perspective view similar to FIGURE 1, but partly in section; and

FIGURE 8 is a perspective view illustrating the manner in which the drum contents may be dispensed.

[0009] The accompanying FIGURES 1-7 depict a particularly preferred embodiment of the multi-compartment drum I according to the present invention. In this regard, the drum I essentially includes separable hemi-cylindrical drum segments in the form of male drum segment 12 and female drum segment 14. Each of the drum segments 12, 14 is comprised of a pair of semicircular upper and lower end panels 12a, 12b and 14a, 14b, joined to and separated by a side wall comprised of a hemicylindrical exterior wall section 12c and 14c, and

substantially planar inner wall section 12d and 14d (see FIGURE 6), respectively.

[0010] The lower end panels 12b, 14b are preferably provided with arcuate recesses 12b', 14b' (or ribs, if desired) for structural strength (see FIGURE 3). The side wall sections 12c, 14c, on the other hand, are preferably provided with recessed handles 12c', 14c', respectively, to facilitate handling of the drum 10.

[0011] As is perhaps more clearly depicted in FIGURE 6, the male drum segment 12 includes a tongue 12e outwardly protruding from the inner wall section 12d, while the female drum segment 14 includes a re-entrant groove 14e defined by the inner wall section 14d. The tongue 12e and groove 14e are conformably shaped so that when united, a relatively tight interference fit is achieved. In this regard, it will be noted that the tongue 12e includes an arcuate head portion 12e' and a neck portion 12e'' of narrower dimension. The head portion 12e' will thus fit conformably into the arcuate receiving channel 14e' of the groove 14e, while the entranceway 14e'' of the groove is dimensioned so as to closely fit the neck portion 12e''. This interlocking arrangement of the tongue 12e/groove 14e prevents the drum segments 12/14, respectively, from readily separating from one another.

[0012] It will be observed, however, that the longitudinal dimensions of the tongue 12e and groove 14e are each less than the overall longitudinal dimension of drum 10. This feature of the present invention will thus ensure that the two segments 12 and 14 are only united to one another in the intended orientation -- i.e., mating of the drum segments in a reverse orientation to that shown in the drawing FIGURES is prevented.

[0013] Although the lower ends of the tongue 12e and groove 14e are shown in the drawing FIGURES as extending to the end (bottom) wall panels 12b and 14b, respectively, they each could terminate in a manner similar to their upper ends (i.e., each spaced from the bottom wall panels 12b, 14b, respectively). However, in the embodiment shown in the drawing FIGURES, it is preferred that the side walls 12c, 14c of the drum segments be provided with circumferential band-receiving channels 12f, 14f (see FIGURE 6) which receive a suitable restraining band 16 (see FIGURE 1) therein. The restraining bands 16 thereby serve to prevent relative longitudinal slippage between the drum segments 12 and 14 and may be used regardless of the particular configuration of the tongue 12e and groove 14e so as to improve the structural integrity of the drum 10 when the drum segments 12, 14 are united to one another.

[0014] The closely adjacent planar inner wall sections 12d, 14d will establish a diametrical parting plane P (which is shown normal to the plane of FIGURE 5) when the tongue 12e and groove 14e are united with one another. According to the present invention, the hemicylindrical wall sections 12c and 14c will each be provided with two sets of longitudinally spaced-apart roll stops 12g, 12h and 14g, 14h, respectively. In this regard, each

of the roll stops 12g is circumferentially opposite to a respective one of roll stops 14h while each of the roll stops 12h is circumferentially opposite to a respective one of the roll stops 14g. As a result, upper and lower circumferentially paired roll stops 12g/14g and 12h/14h are provided asymmetrically straddling the diametrical parting plane P when the drum segments 12 and 14 are united with one another to form the overall cylindrical drum 10. Preferably, each of the roll stops 12g, 12h and 14g, 14h will define a convexly arcuate (e.g., hemispherical) surface.

[0015] The upper end panels 12a and 14a are each provided with respective bungholes 12i, 14i (see FIGURE 8) and caps 12j, 14j, respectively. The bungholes 12i, 14i thus provide access to the interior compartments 12k, 14k (see FIGURE 7) of the segments 12, 14, respectively, so that the compartments 12k, 14k may be filled with a respective volume of dissimilar pourable material, and to allow a respective dissimilar pourable material contained therein to be dispensed when desired.

[0016] As noted in the accompanying drawing FIGURES, the asymmetrical orientation of the circumferentially paired roll stops 12g/14g and 12h/14h and the placement of the bungholes 12i and 14i near the paired roll stops 12g/14g and 12h/14h, respectively, allows the bungholes 12i and 14i to be vertically oriented with one another when the drum 10 is turned on its side and rests upon the paired roll stops 12g/14g or 12h/14h. Therefore, when the drum 10 rests upon a surface S using the set of paired roll stops 12g/14g as shown in FIGURE 8, for example, the vertical orientation of the bungholes 12i and 14i may be reversed by simply rolling the drum 10 along its circumferential side surface (arrow A₁ in FIGURE 8) until it translates a distance (arrow A₂ in FIGURE 8) which is substantially equivalent one-half the circumferential dimension of drum 10, and rests upon the other set of paired roll stops 12h/14h. As such, the respective contents within the compartments 12k and 14k may be dispensed separately from the drum 10 through bungholes 12i and 14i, respectively.

Claims

1. A multi-compartment storage drum comprising: a pair of separably united hemi-cylindrical drum segments (12, 14); each said drum segment including upper and lower semicircular end panels (12a, 12b and 14a, 14b) which are joined to, and spaced apart by, a side wall having a hemi-cylindrical exterior side wall section (12c, 14c) and a planar interior side wall section (12d, 14d), wherein said end panels and said interior and exterior side wall sections of each said drum segment collectively establish a compartment to hold a volume of pourable material, and wherein said interior side wall sections (12d, 14d) of said drum segments are disposed closely adjacent to one another when said drum segments

are united so that said drum has a generally cylindrical shape by virtue of said hemi-cylindrical exterior side wall sections (12c, 14c), said closely adjacent interior side wall sections establishing a longitudinally diametrical parting plane (P) of said storage drum, and wherein said storage drum further comprises circumferentially paired roll stops (12g, 12h and 14g, 14h) outwardly extending from said exterior side wall sections (14c, 12c) of said drum sections and asymmetrically straddling said longitudinally diametrical parting plane (P); and bung holes (12i, 14i) formed in each of said end panels (12a, 14a) and disposed closely adjacent said parting plane such that said bung holes are oriented substantially vertically with respect to one another when said drum is resting on one set of said paired roll stops and such that said vertical orientation of said bung holes may be reversed by rolling said storage drum along said side wall sections until said drum rests upon another set of paired roll stops (12h, 14h).

2. A storage drum as in claim 1, further comprising a groove (14e) formed in the planar interior side wall section (14d) of one drum segment, and a tongue (12e) outwardly protruding from the planar interior side wall section (12d) of the other drum segment, said tongue and groove being conformably shaped so as to be interlockable and thereby separably unite said drum segments one the other.
3. A storage drum as in claim. 2, wherein said tongue (12e) and groove (14e) are oriented longitudinally.
4. A storage drum as in claim 3, wherein at least one terminal end of said tongue (12e) and groove (14e) terminates short of an adjacent end panel.
5. A storage drum as in claim 3, wherein said tongue (12e) includes an arcuate head portion (12e') and a neck portion (12e'') of reduced cross-sectional dimension joining said head portion to said planar interior side wall section of the other drum segment.
6. A storage drum as in claim 5, wherein said groove (14e) includes an arcuate receiving channel (14e') conforming to said head portion of said tongue (12e) and an entranceway (14e'') corresponding substantially to said reduced cross-sectional dimension of said neck portion (12e'').
7. A storage drum as in claim 6, comprising upper and lower sets of said circumferentially paired roll stops.
8. A storage drum as in claim 7, wherein each of said roll stops (12g, 12h and 14g, 14h) defines a convex arcuate surface.

9. A storage drum as in claim 1, wherein said exterior side wall sections (12c, 14c) include handles (12c', 14c').

10. A storage drum as in claim 9, wherein said handles (12c', 14c') are recessed.

11. A storage drum as in claim 1, 2, 3 or 4, wherein said exterior side wall sections (12c, 14c) include circumferential band-receiving channels (12f, 14f), and restraining bands (16) disposed in said band-receiving channels to prevent relative separation of said drum segments.

12. A drum as in claim 1, wherein lower end panels (12b, 14b) include arcuate reinforcing structures (12b', 14b').

13. A drum as in claim 12, wherein said reinforcing structures are recessed relative to said lower end panels (12b, 14b).

14. A drum as in claim 1, further comprising caps (12j, 14j) covering said bung holes (12i, 14i).

Patentansprüche

1. Mehrkammerlagerfaß, das folgendes umfaßt: ein Paar trennbar zusammengefügte halbzyklindrische Faßsegmente (12, 14); wobei jedes der Faßsegmente eine obere und eine untere halbkreisförmige Endplatte (12a, 12b und 14a, 14b) enthält, die mit einer Seitenwand, die einen halbzyklindrischen Außenwandabschnitt (12c, 14c) und einen planaren Innenseitenwandabschnitt (12d, 14d) aufweist, verbunden sind und durch sie getrennt werden, wobei die Endplatten und der Innen- und Außenseitenwandabschnitt jedes Faßsegments zusammen eine Kammer bilden, um ein Volumen gieß/schüttbaren Stoffes aufzunehmen, und wobei die Innenseitenwandabschnitte (12d, 14d) der Faßsegmente dicht nebeneinander angeordnet sind, wenn die Faßsegmente zusammengefügt sind, so daß das Faß aufgrund der halbzyklindrischen Außenseitenwandabschnitte (12c, 14c) eine allgemein zylindrische Form aufweist, wobei die dicht nebeneinanderliegenden Innenseitenwandabschnitte eine in Längsrichtung diametrale Trennfläche (P) des Lagerfasses bilden, und wobei das Lagerfaß weiter um den Umfang paarweise angeordnete Rollsperrn (12g, 12h und 14g, 14h) umfaßt, die sich von den Außenseitenwandabschnitten (14c, 12c) der Faßabschnitte nach außen erstrecken und beidseitig der in Längsrichtung diametralen Trennfläche (P) asymmetrisch angeordnet sind; und in jeder der Endplatten (12a, 14a) ausgebildete Spundlöcher (12i, 14i), die dicht neben der Trennfläche so positioniert sind, daß die Spundlö-

cher bezüglich einander im wesentlichen vertikal ausgerichtet sind, wenn das Faß auf einem Satz der paarweise angeordneten Rollsperrn ruht, und so, daß die vertikale Ausrichtung der Spundlöcher durch Rollen des Lagerfasses entlang den Seitenwandabschnitten, bis das Faß auf einem anderen Satz von paarweise angeordneten Rollsperrn (12h, 14h) ruht, umgekehrt werden kann.

2. Lagerfaß nach Anspruch 1, das weiterhin eine Nut (14e), die in dem planaren Innenseitenwandabschnitt (14d) eines Faßsegments ausgebildet ist, und eine Feder (12e), die sich von dem planaren Innenseitenwandabschnitt (12d) des anderen Faßsegments nach außen erstreckt, umfaßt, wobei die Feder und die Nut konformal ausgebildet sind, so daß sie ineinandergreifen können und dadurch die Faßsegmente trennbar zusammenfügen können.

3. Lagerfaß nach Anspruch 2, bei dem die Feder (12e) und die Nut (14e) in Längsrichtung ausgerichtet sind.

4. Lagerfaß nach Anspruch 3, bei dem mindestens ein Abschlußende der Feder (12e) und der Nut (14e) kurz vor einer benachbarten Endplatte abschließt.

5. Lagerfaß nach Anspruch 3, bei dem die Feder (12e) einen bogenförmigen Kopfteil (12e') und einen Halsteil (12e'') vermindelter Querschnittsabmessung, der den Kopfteil mit dem planaren Innenseitenwandabschnitt des anderen Faßsegments verbindet, enthält.

6. Lagerfaß nach Anspruch 5, bei dem die Nut (14e) einen bogenförmigen Aufnahmekanal (14e'), der zu dem Kopfteil der Feder (12e) konformal ist, und einen Einlaß (14e''), der der verminderten Querschnittsabmessung des Halsteils (12e'') im wesentlichen entspricht, enthält.

7. Lagerfaß nach Anspruch 6, das obere und untere Sätze der um den Umfang paarweise angeordneten Rollsperrn umfaßt.

8. Lagerfaß nach Anspruch 7, bei dem jede der Rollsperrn (12g, 12h und 14g, 14h) eine konvexe, bogenförmige Fläche definiert.

9. Lagerfaß nach Anspruch 1, bei dem die Außenseitenwandabschnitte (12c, 14c) Griffe (12c', 14c') enthalten.

10. Lagerfaß nach Anspruch 9, bei dem die Griffe (12c', 14c') ausgespart sind.

11. Lagerfaß nach Anspruch 1, 2, 3 oder 4, bei dem die Außenseitenwandabschnitte (12c, 14c) um den

Umfang ausgebildete Bandaufnahmekanäle (12f, 14f) und in den Bandaufnahmekanälen angeordnete Haltebänder (16) zur Verhinderung einer Trennung der Faßsegmente voneinander enthalten.

12. Faß nach Anspruch 1, bei dem untere Endplatten (12b, 14b) bogenförmige Verstärkungsstrukturen (12b', 14b') enthalten.

13. Faß nach Anspruch 12, bei dem die Verstärkungsstrukturen bezüglich der unteren Endplatten (12b, 14b) ausgespart sind.

14. Faß nach Anspruch 1, das weiterhin die Spundlöcher (12i, 14i) bedeckende Kappen (12j, 14j) umfaßt.

Revendications

1. Fût de stockage à plusieurs compartiments, comprenant deux segments de fût hémicylindriques (12, 14) réunis de manière séparable, chacun de ces segments comportant des panneaux d'extrémité semicirculaires supérieur et inférieur (12a, 12b et 14a, 14b) qui sont joints à une paroi latérale ayant une partie extérieure hémicylindrique (12c, 14c) et une partie intérieure plane (12d, 14d) et espacés par cette paroi latérale, les panneaux d'extrémité et les parties intérieure et extérieure de la paroi latérale de chaque segment de fût créant ensemble un compartiment destiné à contenir un certain volume de matière fluide, et dans lequel les parties intérieures (12d, 14d) des parois latérales des segments de fût sont contiguës lorsque les segments de fût sont réunis, de sorte que le fût a une forme générale cylindrique en raison des parties extérieures hémicylindriques (12c, 14c) des parois latérales, les parties intérieures contiguës des parois latérales créant un plan de partage diamétral longitudinal (P) du fût, et le fût comprenant en outre des butées de roulement appariées circonférentiellement (12g, 12h et 14g, 14h) qui s'étendent vers l'extérieur à partir des parties extérieures (14c, 12c) des parois latérales des segments de fût et sont à cheval asymétriquement sur le plan de partage diamétral longitudinal (P), et des bondes (12i, 14i) faites dans chacun des panneaux d'extrémité (12a, 14a) et placées tout près du plan de partage de façon à être orientées sensiblement verticalement l'une par rapport à l'autre lorsque le fût repose sur un groupe de butées de roulement appariées, et qu'on puisse renverser cette orientation verticale des bondes en faisant rouler le fût le long des parties extérieures des parois latérales jusqu'à ce qu'il repose sur un autre groupe de butées de roulement appariées (12h, 14h).

2. Fût de stockage selon la revendication 1, compre-

nant en outre une rainure (14e) faite dans la partie intérieure plane (14d) de la paroi latérale d'un segment de fût et une languette (12e) saillant vers l'extérieur de la partie intérieure plane (12d) de la paroi latérale de l'autre segment de fût, cette languette et cette rainure étant de forme correspondante afin de pouvoir s'accoupler et par là réunir de manière séparable les segments de fût.

3. Fût de stockage selon la revendication 2, sur lequel la languette (12e) et la rainure (14e) sont orientées longitudinalement. 10
4. Fût de stockage selon la revendication 3, sur lequel au moins une extrémité de la languette (12e) et de la rainure (14e) est située à une certaine distance du panneau d'extrémité voisin. 15
5. Fût de stockage selon la revendication 3, sur lequel la languette (12e) comporte une partie tête arquée (12e') et une partie col (12e'') de section réduite qui joint la partie tête à la partie intérieure plane de la paroi latérale de l'autre segment de fût. 20
6. Fût de stockage selon la revendication 5, sur lequel la rainure (14e) comporte un canal récepteur arqué (14e') qui épouse la partie tête de la languette (12e) et une entrée (14e'') qui correspond sensiblement à la section réduite de la partie col (12e''). 25
30
7. Fût de stockage selon la revendication 6, comprenant des groupes supérieurs et inférieurs de butées de roulement appariées circonférentiellement.
8. Fût de stockage selon la revendication 7, sur lequel chacune des butées de roulement (12g, 12h et 14g, 14h) a une surface convexe. 35
9. Fût de stockage selon la revendication 1, sur lequel les parties extérieures (12c, 14c) des parois latérales comportent des poignées (12c', 14c'). 40
10. Fût de stockage selon la revendication 9, sur lequel les poignées (12c', 14c') sont en creux. 45
11. Fût de stockage selon l'une des revendications 1, 2, 3 et 4, sur lequel les parties extérieures (12c, 14c) des parois latérales présentent des gorges circonférentielles (12f, 14f) et des bandes de retenue (16) placées dans ces gorges pour empêcher la séparation des segments de fût. 50
12. Fût de stockage selon la revendication 1, sur lequel les panneaux d'extrémité inférieurs (12b, 14b) ont des structures de renfort arquées (12b', 14b'). 55
13. Fût de stockage selon la revendication 12, sur lequel les structures de renfort sont en creux par

rapport aux panneaux d'extrémité inférieurs (12b, 14b).

14. Fût de stockage selon la revendication 1, comprenant en outre des bouchons (12j, 14j) qui couvrent les bondes (12i, 14i).

FIG.1

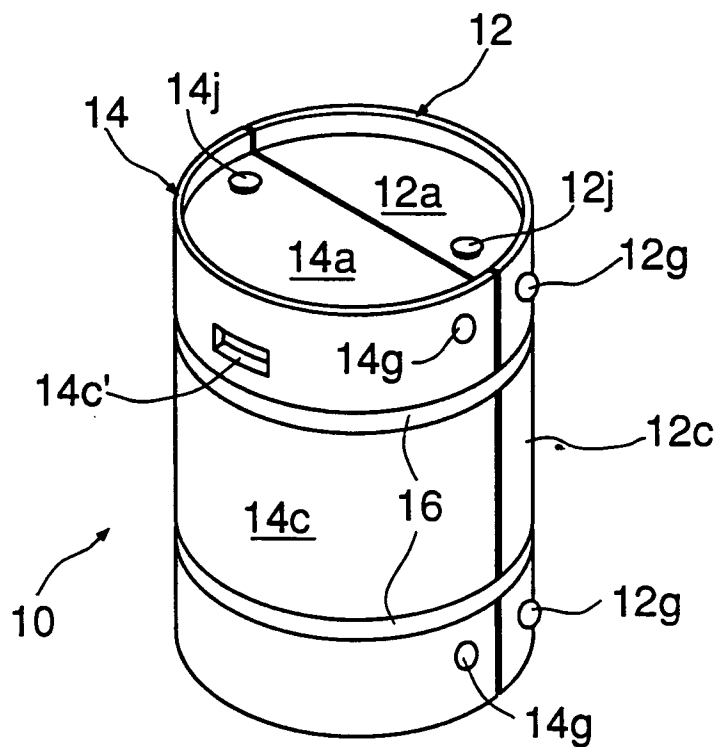


FIG.2

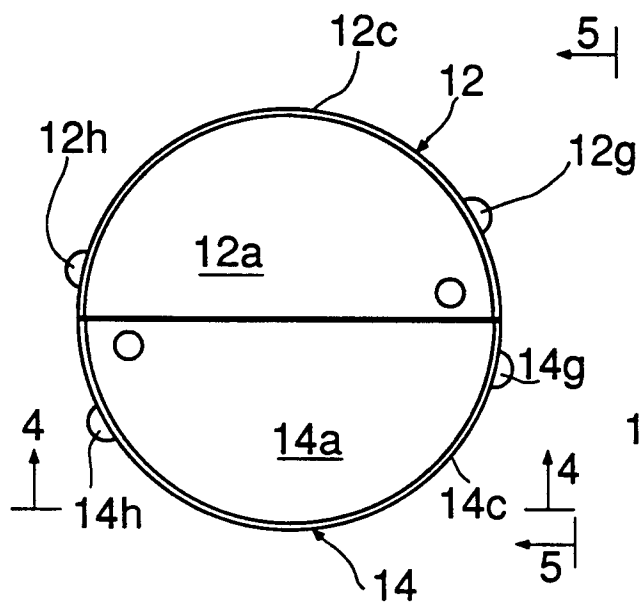


FIG.3

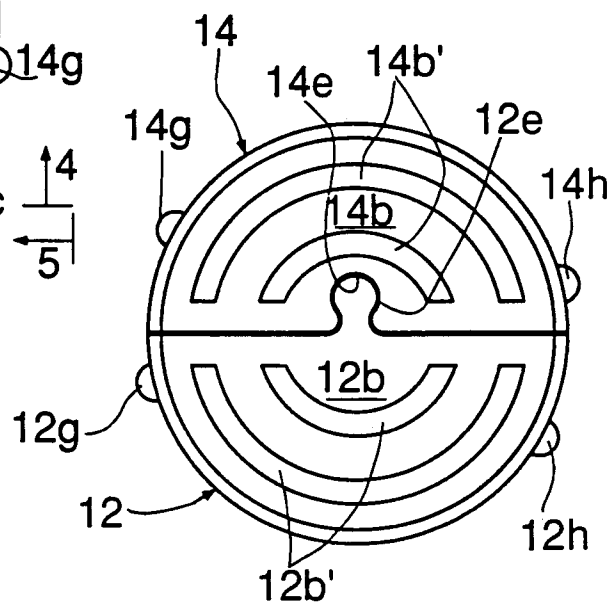


FIG.4

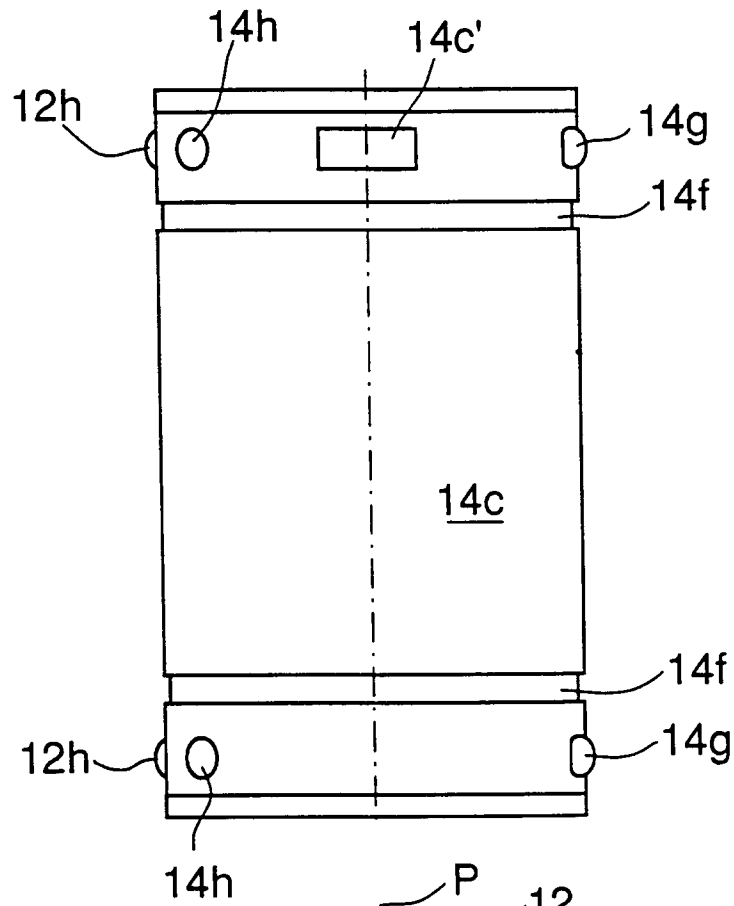


FIG.5

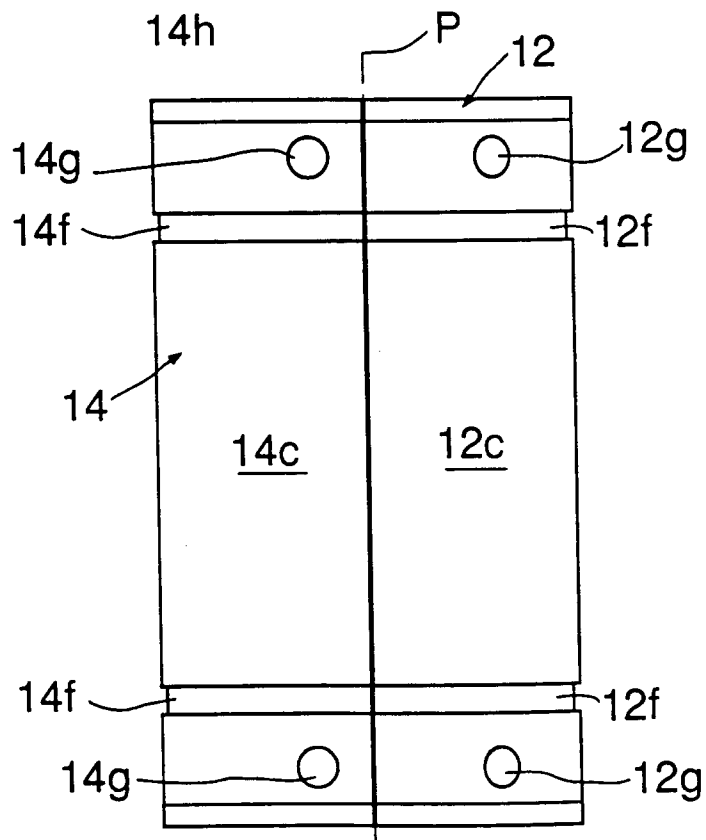


FIG.6

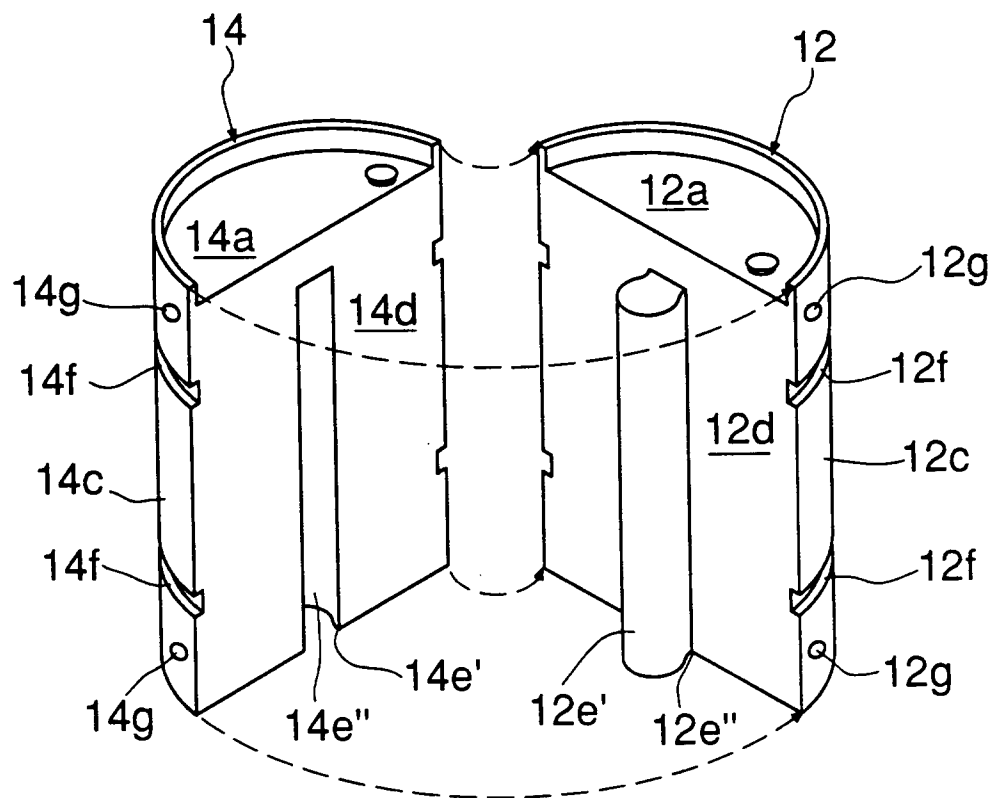


FIG.7

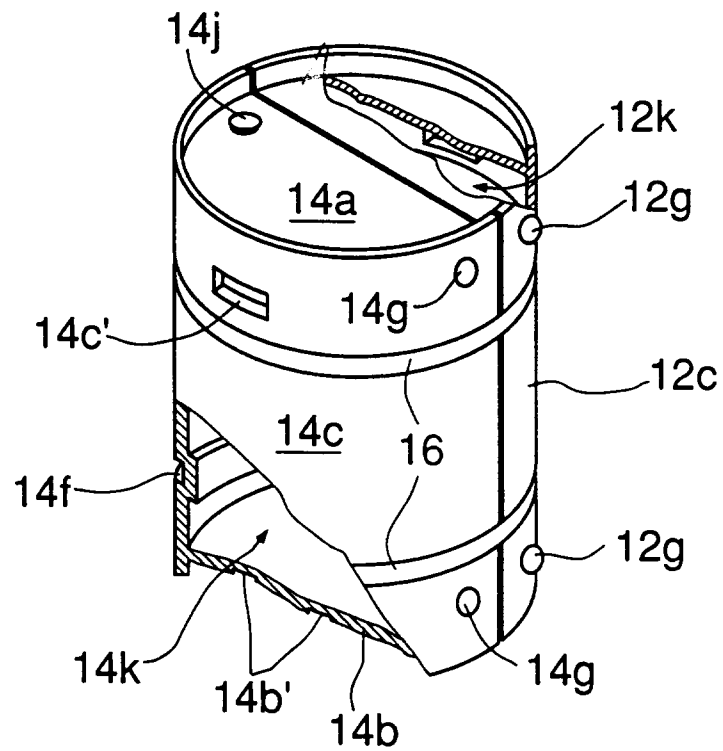


FIG.8

