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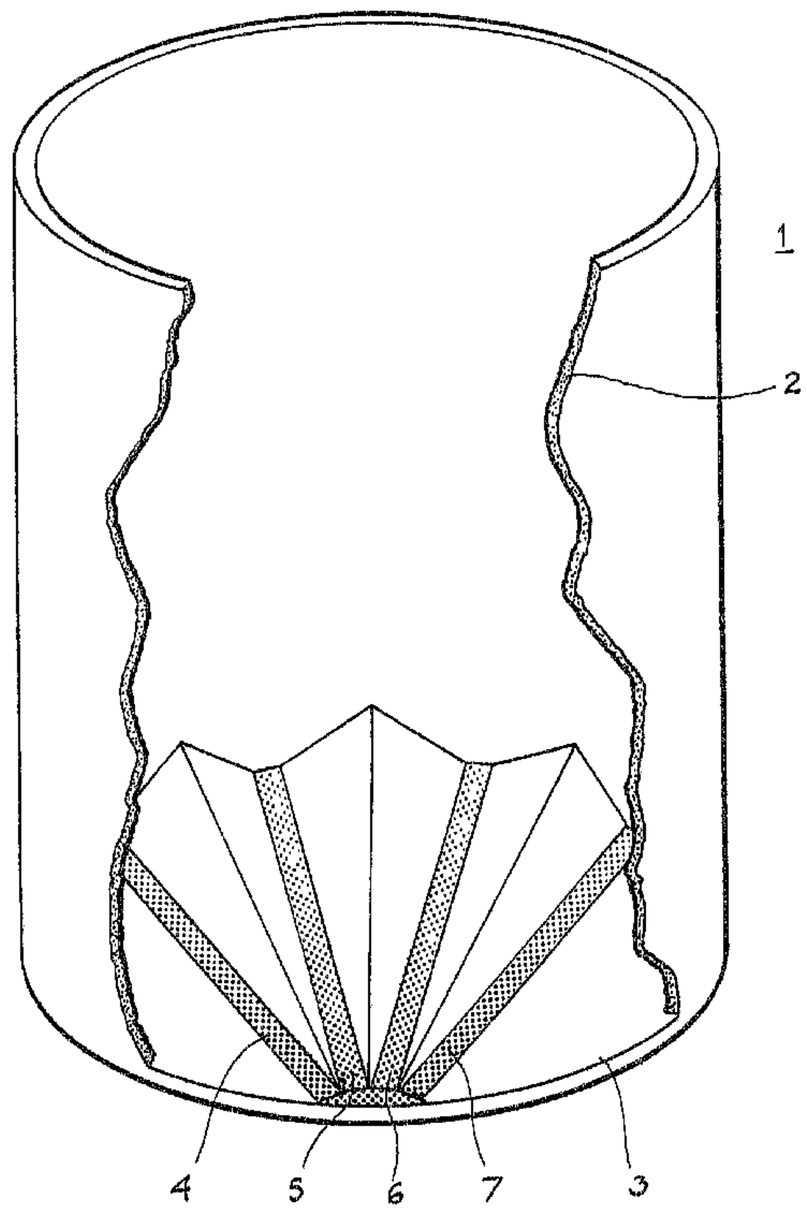
(54) Titre : DISPOSITIF SERVANT A EMPECHER L'OBSTRUCTION DE L'ARRIVEE D'AIR
(54) Title: DEVICE FOR PREVENTING AIR-SUPPLY OBSTRUCTION



(57) Abrégé/Abstract:
A silo (1) for cereals has channels (4-7) in its bottom (3), the channels (4-7) being provided on their upper sides (8-11) with passages for the through-flow of air, in order to facilitate emptying the silo (1) through an outlet opening (12). Said passages have a tendency to become clogged by dust present in the cereals. In order to prevent this, the end of each channel (4) located in the vicinity of the outlet opening (12) is provided with one or more openings (17) for the passage of said dust while at the same time limiting the air accompanying it to a minimum.

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A silo (1) for cereals has channels (4-7) in its bottom (3), the channels (4-7) being provided on their upper sides (8-11) with passages for the through-flow of air, in order to facilitate emptying the silo (1) through an outlet opening (12). Said passages have a tendency to become clogged by dust present in the cereals. In order to prevent this, the end of each channel (4) located in the vicinity of the outlet opening (12) is provided with one or more openings (17) for the passage of said dust while at the same time limiting the air accompanying it to a minimum.

A DEVICE FOR PREVENTING AIR-SUPPLY OBSTRUCTION

The present invention relates to a device for preventing air-supply obstruction. More particularly the device pertains to a silo having a bottom and side wall. The silo is intended for use as a storage container for cereals and is also designed to be emptied when required. A known silo has an outlet opening at the bottom and a bottom which is so shaped that cereals lying on the bottom will move towards the due to a sloping surface. A number of channels are arranged in such a bottom, leading from the inner wall of the silo towards its outlet opening. The channels are arranged in said bottom and are provided on their upper sides with passages for air. Air is namely supplied to the ends of the channels close to the silo wall. The passages in the channels shall be so small that cereals are unable to pass through them. When emptying such a silo is suitable to supply air to the channels so that the cereals more readily leave the silo. However, a problem arises with said channels since the cereals bring with them a considerable amount of small particles such as dust and these small particles have a tendency to clog the channels so that air cannot pass through them, with the result that it can be difficult to completely empty a silo. If the channels are blocked the remaining cereals must be removed manually through the outlet opening. It is extremely hazardous for people to enter a silo in order to empty it. If the silo is filled with cereals and refuses to empty, since it is an organic product, it should be supplied with cooling air and this is done with the aid of the same channels as those supplying air during emptying.

The object of the present invention is to endeavour to avoid said obstruction. Success has been achieved in a satisfactory manner by providing the end located nearest to the outlet opening, on its transverse end, with openings or an opening and this should preferably be located close to the bottom of the relevant channel. Air can pass through the opening and takes with it the dust particles present in the channel and transports them to the outlet opening. The dust can be removed in a later operation. The opening in the channel for said dust should be as small as possible so that a minimum amount of air escapes from the channel and does not impede the air flowing out through the upper side of the channel.

Therefore, in accordance with the present invention, there is provided a device for preventing air-supply obstruction in order to facilitate emptying a silo for cereals, said silo having a bottom and a side wall, the bottom being so shaped that cereal types located thereon will move towards an outlet opening, channels or pipes being arranged in said bottom for bleeding off air, one end of said channels, connected to a supply of air, leading from or in the vicinity of the side wall and being directed towards the outlet opening, an other end of each of the channels being located at the outlet opening and an upper side of the channels substantially coinciding with the bottom and being perforated or provided with passages of such width that an individual grain of cereal cannot enter, wherein the other end of each channel has an opening or openings which are sufficiently large to permit any cereal dust that may have collected in the channel to pass to the outlet opening while limiting the air accompanying it to a minimum.

Also in accordance with the present invention, there is provided a silo for cereals where an air supply is employed for aiding the emptying of the cereals,

means or preventing obstruction to the flow of air because of dust particle accumulation,

the silo having a vertical side wall, a sloping bottom, and an outlet opening for the cereals,

said means for preventing obstruction to the flow of air comprising:

a plurality of channels formed in said sloping bottom, said channels having two ends and being arranged with one of their ends converging toward the outlet opening,

said air supply connected to the other ends of the channels,

each of said channels being covered with means having perforations permitting the passage of air but inhibiting the passage of cereals,

said means having perforations substantially coinciding with the sloping bottom, and

a transverse wall near the outlet opening of each of the channels,

said transverse wall having at least one opening sufficiently large to permit dust particles collected in the channels to pass but limiting the air flow to a small quantity.

The present invention will be described in more detail with reference to the accompanying two sheets of drawings, in which

Figure 1 shows a silo,

Figure 2 shows an arrangement of channels at the bottom of the silo,

Figure 3 shows a cross section of the bottom of a silo and

Figure 4 shows a channel for air provided with passages on its upper side.

In the drawings 1 is a silo with a vertical wall 2 and a bottom 3. The bottom 3 is provided with four channels 4, 5, 6 and 7 which have rectangular cross section, the upper side of the channels being provided with passages for air. The bottom 3 is arranged to slop towards the outlet opening 12 which means that all points on the bottom 3 slope towards the outlet opening 12. The ends of the channels at the inner wall of the silo are connected to pipes 14 and 15 which in turn communicate with a common pipe 13 through which air is supplied to facilitate emptying the silo, or cooling air to keep the cereals in the silo intact. The bottom of the silo is designated from 18 to 22. Each channel is provided on its upper side with passages, preferably achieved by the upper part of each channel consisting of mesh. Figures 3 and 4 show such mesh tops 8 to 11 for the channels 4 to 7. The surfaces 20, 21 and 22 between the channels may be in the nature of ridges, as can be seen clearly in Figure 3. Due to these ridges the upper surface of the channels will form the bottom of flow furrows for a cereal. Each channel is provided at its lower end with a transverse wall 16 with an opening 17 for dust. This opening is such that all the dust which collects in a channel is carried to the outlet opening whereas the air passing through the opening is reduced to a minimum. The opening is thus dimensioned so as to allow through a minimum of air while at the same time all dust is removed from the channel.

The provision of said opening 17 in the channels achieves the great advantage of eliminating the need for manual emptying of cereal remnants in a silo, and thereby the advantage that staff do have not to enter the silo in order to completely empty it.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A device for preventing air-supply obstruction in order to facilitate emptying a silo (1) for cereals, said silo (1) having a bottom (3) and a side wall (2), the bottom (3) being so shaped that cereal types located thereon will move towards an outlet opening (12), channels or pipes (4-7) being arranged in said bottom (3) for bleeding off air, one end of said channels, connected to a supply of air, leading from or in the vicinity of the side wall (2) and being directed towards the outlet opening (12), an other end of each of the channels (4-7) being located at the outlet opening (12) and an upper side (8-11) of the channels (4-7) substantially coinciding with the bottom (3) and being perforated or provided with passages of such width that an individual grain of cereal cannot enter, wherein the other end of each channel has an opening (17) or openings which are sufficiently large to permit any cereal dust that may have collected in the channel (8) to pass to the outlet opening (12) while limiting the air accompanying it to a minimum.

2. A device as claimed in claim 1, wherein the part (20) of the bottom located between two channels (4 and 5) is in the nature of a ridge with a sloping surface on each side of said two channels (4 and 5).

3. In a silo for cereals where an air supply is employed for aiding the emptying of the cereals,

means or preventing obstruction to the flow of air because of dust particle accumulation,

the silo having a vertical side wall (2), a sloping bottom (3), and an outlet opening (12) for the cereals,

said means for preventing obstruction to the flow of air comprising:

a plurality of channels (4-7) formed in said sloping bottom, said channels having two ends and being arranged with one of their ends converging toward the outlet opening (12),

said air supply (14, 15) connected to the other ends of the channels,

each of said channels (4-7) being covered with means having perforations permitting the passage of air but inhibiting the passage of cereals,

said means having perforations substantially coinciding with the sloping bottom, and

a transverse wall (16) near the outlet opening (12) of each of the channels,

said transverse wall (16) having at least one opening (17) sufficiently large to permit dust particles collected in the channels to pass but limiting the air flow to a small quantity.

4. In the silo of claim 3 wherein the sloping bottom (3) located between the channels (4-5, 5-6, 6-7) takes the form of a ridge (20, 21, 22) with a surface sloping on each side toward the channels.

FIG. 1

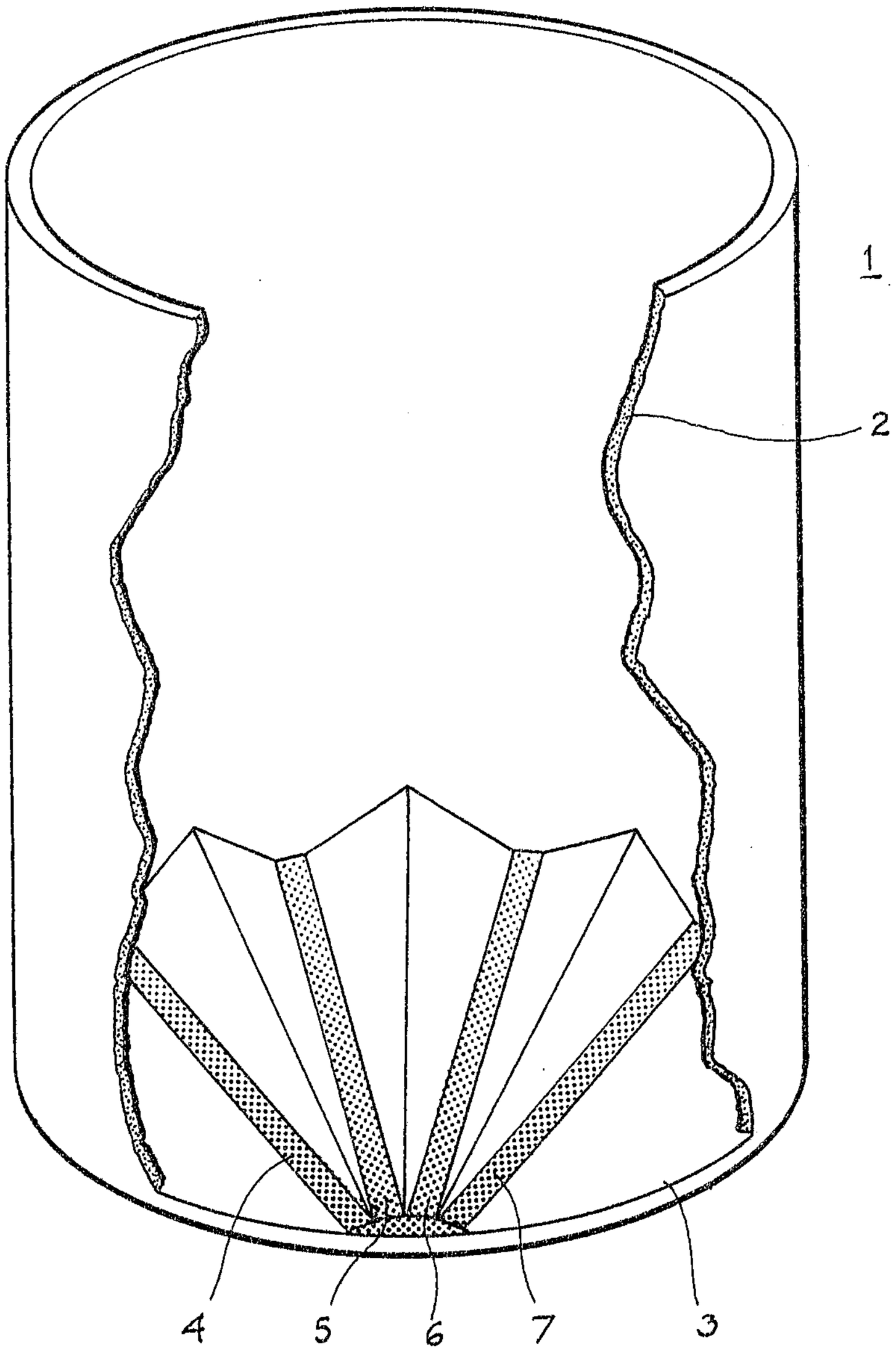

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FIG. 2

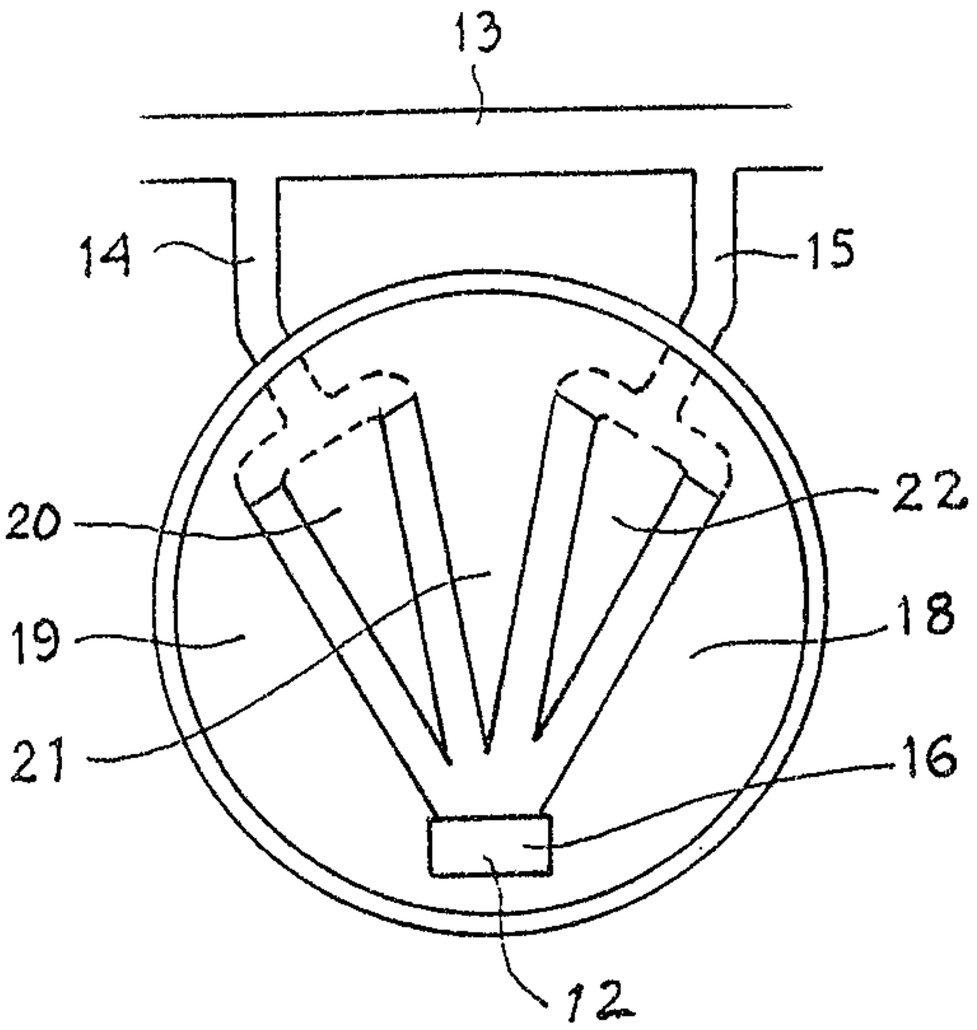


FIG. 3

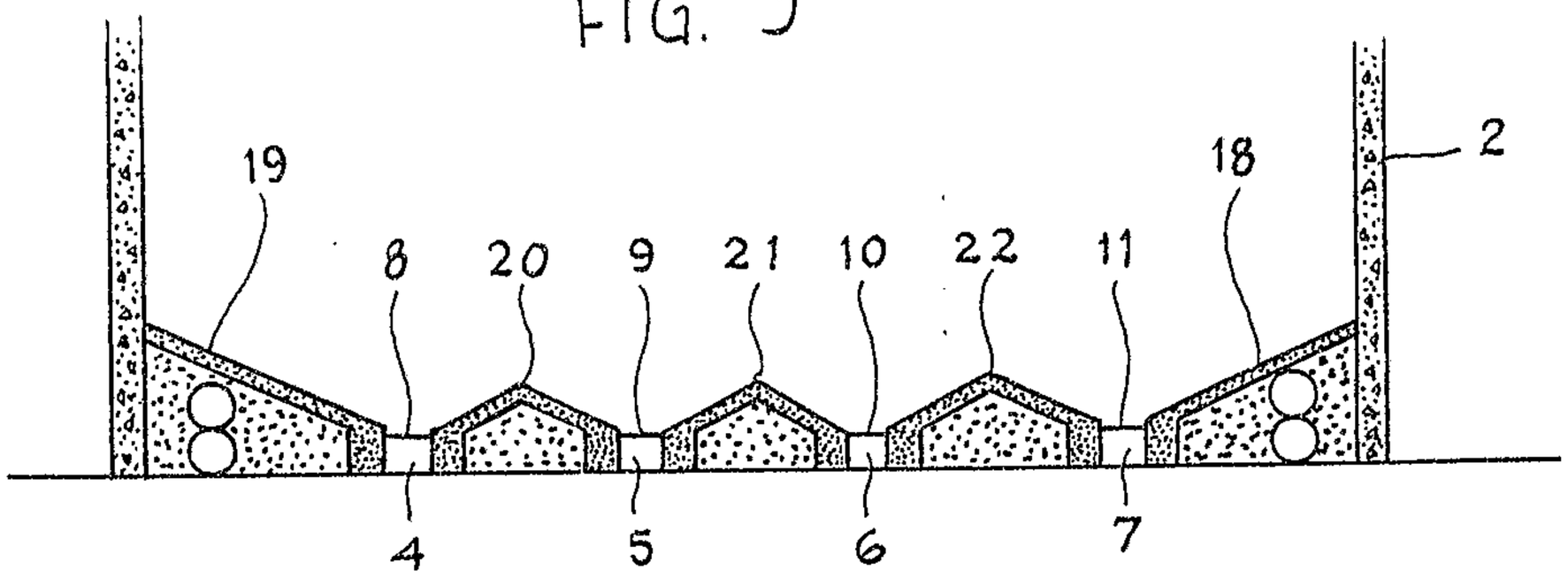
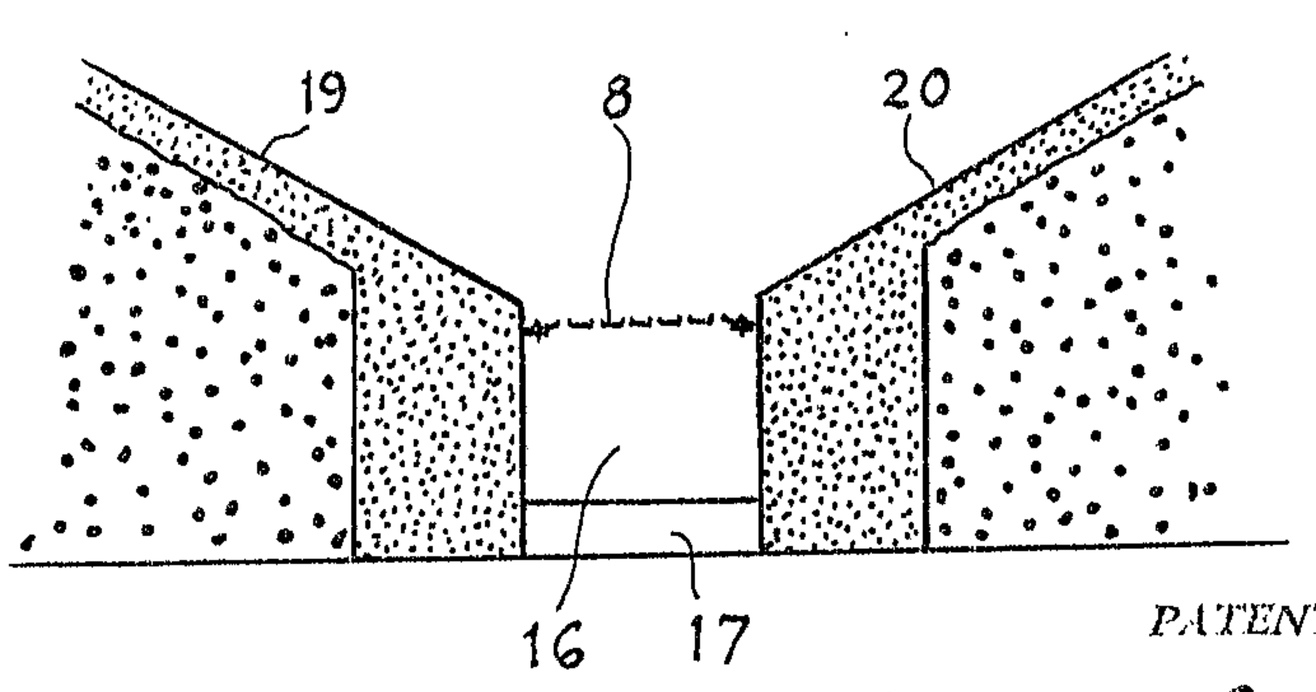


FIG. 4



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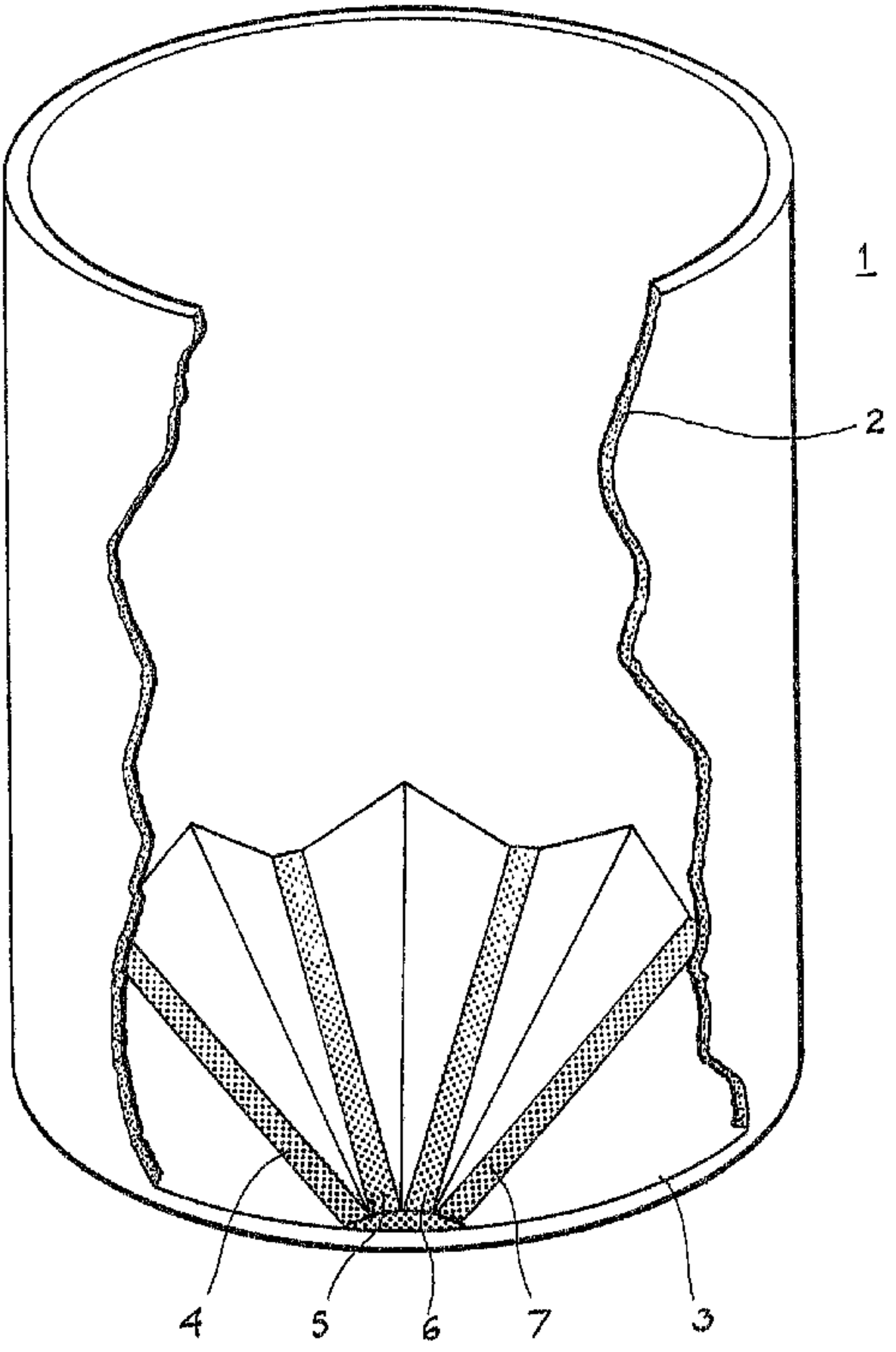
Beresford Ogilvy Fitzpatrick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