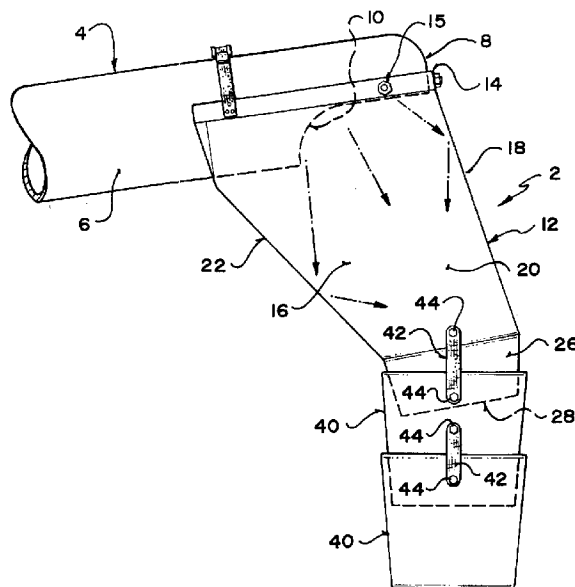




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(54) **SOUFFLEUSE DE MOISSONNEUSE-BATTEUSE**
(54) **COMBINE SPOUT**



(57) A spout is used for confining the grain flow from a combine unloading auger. The spout includes a chute that mounts on the auger tube and slopes outwardly from the end of the auger tube to an outlet opening where it carries a set of nested, frusto-conical extensions, flexibly interconnected so that the grain flow will be directed in a contained flow downwardly into a truck box.

ABSTRACT OF THE INVENTION

A spout is used for confining the grain flow from a combine unloading auger. The spout includes a chute that mounts on the auger tube and slopes outwardly from the end of the auger tube to an outlet opening where it carries a set of nested, frusto-conical extensions, flexibly interconnected so that the grain flow will be directed in a contained flow downwardly into a truck box.

COMBINE HARVESTER DISCHARGE SPOUT

FIELD OF THE INVENTION

The present invention relates to combine harvesters and more particularly to a flow control spout for the unloading auger of a combine harvester.

BACKGROUND

Grain or seed is delivered from a combine harvester to the box of a grain truck by a delivery auger on the combine. The auger has a discharge at the end of the auger tube through which the grain is delivered. Because the grain is delivered at a high flow rate, there is a considerable spreading of the grain or seed as it leaves the auger discharge. This in turn leads to "splash", spillage and wind loss. This may be controlled to a limited extent by a spout attached to the end of the auger to provide some containment of the grain flow. With the known spouts, there is still a considerable spreading of the flow and potential loss. These spouts are short and of large flow cross section in order to present little or no restriction to the grain flow from the auger and to avoid plugging. Plugging will cause damage to the auger and its drive.

The present invention relates to the provision of a novel spout for combine discharge augers.

According to the present invention there is provided a spout for a combine unloading auger having an auger tube with an outer end and an auger tube discharge opening on a bottom side of the auger tube adjacent the outer end, the spout comprising:

- a chute having:

- a receiving opening larger than the auger tube discharge opening;

- an outlet opening smaller than the receiver opening; and

a convergent peripheral wall extending from the inlet opening towards the outlet opening; and

a lower, annular discharge collar between the peripheral wall and the outlet opening;

chute mounting means for mounting the chute on the auger tube with the receiving opening confronting the auger tube discharge opening and the peripheral walls sloping outwardly and downwardly from the end of the auger tube and under the discharge opening;

a plurality of tapered extension tubes; and

tube mounting means mounting the extension tubes on the chute, in series extending from the chute outlet opening.

The sloping peripheral wall intercepts scattered flow from the auger discharge, and condenses the flow in a direction with an outward component. This produces a concentrated flow without excessive back pressure in the auger. The discharge collar then redirects the concentrated flow down into a truck box through the extension tubes, which limit wind scatter.

The extension tubes are preferably flexibly coupled.

The flow from the spout may be delivered to all areas of a grain box without the significant loss of grain that might otherwise occur.

For bottom swing augers, the spout may be mounted on the auger tube to be rotated from its normal use position to a transport position in which it does not interfere with the movement of the auger to its transport position.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, which illustrate exemplary embodiments of the present invention:

Figure 1 is a side elevation of a spout according to the present invention;

Figure 2 is a plan view of the chute component of Figure 1;

Figure 3 is an inner end view of the chute of Figure 2;

Figure 4 is a side view of an alternative embodiment of spout; and

Figure 5 is a detail of the embodiment of Figure 4.

DETAILED DESCRIPTION

Referring to the accompanying drawings and especially to Figures 1, 2 and 3, there is illustrated a spout 2 for use on a combine unloading auger 4. The auger has an auger tube 6 with an outer end 8 and a discharge opening 10 on the bottom side of the tube, adjacent the outer end.

The spout 2 includes a chute component 12 with a U-shaped flange 14 which extends around the end and sides of the auger tube, above the discharge opening. The flange is fastened to the auger tube using bolts 15. A peripheral wall 16 of the chute depends from the flange 14. It includes an outer end portion 18, two side portions 20 and an inner end portion 22. The peripheral wall slopes outwardly from the end of the auger tube, with the outer end portion 18 extending beyond the end of the auger tube and the inner end portion 22 extending under the discharge opening of the auger tube. At the top, the chute has a receiving opening 24. The receiving opening is circumscribed by the peripheral wall 16 and confronts the discharge opening of the auger tube. At the bottom end of the peripheral wall is a frusto-conical discharge collar 26 leading to a chute outlet opening 28 that is off-set outwardly with respect to the receiving opening. Both the inner end portion and outer end portion 18 of the peripheral wall 16 slope outwardly with respect to the auger tube, with the inner end portion 22 converging towards the outer end portion 18 so that the chute tapers from the receiving opening 24 to the discharge collar 26. The collar is inclined with respect to the flow leaving the upper, convergent section of the chute, so that the grain flow will be re-directed down into a grain box.

Between the inner end portion 22 of the peripheral wall and the inner end of the flange 14 is an inner end wall 30. This is a crescent shaped panel with a U-shaped cut line 32 at the bottom so that the panel can be cut away. This allows the chute to be oriented at the appropriate angle on a high angle bottom swing auger. With the bottom swing auger, it may also of importance to be able to swing the spout out of the way when the auger is moved to its transport position. This is achieved in this embodiment by using two straps 34 that extend across the top of the auger tube from opposite sides of the chute and clamp the chute onto the auger tube using a tensioning clamp 36. A single bolt 15 is used on each side of the auger tube for connecting it to the flange. When the auger is to be moved to the transport position, the strap clamp 36 is released and the bolts 15 undone, allowing the spout to be rotated about the auger tube and then clamped in a transport position using the straps and clamp 36.

At the outlet end of the chute are two frusto-conical extension tubes 40. The wide upper end of the upper extension tube is positioned over the frusto-conical discharge collar 26 of the peripheral wall 16 while the lower end extension tube 40 similarly fits over the lower end of the upper extension 40. The extensions are connected to one another and to the chute 12 by straps 42 from the chute to the upper extension tube and from the upper extension tube to the lower extension on opposite sides of the spout. The straps are held in place using bolts 44. This extension is thus flexible and hangs vertically from the end of the chute to ensure that the condensed flow of grain leaving the chute is protected against wind scatter as it falls vertically into a truck box.

An alternative embodiment of the spout especially designed for use on a bottom swing auger with a high angle and limited space for the spout in the transport position. The spout 46 incorporates a hood 48 that extends over the end of the auger tube. At the inner end 50 of the hood 48, the spout has a set of

cylindrical rings 52 that engage over the auger tube. The rings are of sequentially smaller diameter towards the inner end of the spout. To mount the spout on the auger tube, the rings are cut off to provide an opening that matches the size of the auger tube. A strap 54 extends part way around the auger tube and through two slots 56 in the hood 48. A tightener 58 is used to tighten the strap on the auger tube to clamp the spout in position. When it is desired to rotate the spout on the auger tube to accommodate movement of the auger tube to the transport position the tightener 58 is released, the spout rotated and the tightener engaged once more.

While particular embodiments of the present invention have been described in the foregoing, it is to be understood that other embodiments are possible within the scope of the invention and are intended to be included herein. The invention is intended to be limited solely by the scope of the appended claims.

CLAIMS

1. A spout for a combine unloading auger 4 having an auger tube 6 with an outer end 8 and an auger tube discharge opening 10 on a bottom side of the auger tube adjacent the outer end, the spout comprising:

a chute 12 having:

a receiving opening 24 larger than the auger tube discharge opening 10;

an outlet opening 28 smaller than the receiver opening; and

a convergent peripheral wall 16 extending from the inlet opening towards the outlet opening; and

a lower, annular discharge collar 26 between the peripheral wall and the outlet opening;

chute mounting means (15, 34; 48, 54) for mounting the chute on the auger tube with the receiving opening confronting the auger tube discharge opening and the peripheral walls sloping outwardly and downwardly from the end of the auger tube and under the discharge opening;

a plurality of tapered extension tubes 40; and

tube mounting means 42 mounting the extension tubes on the chute, in series extending from the chute outlet opening.

2. A spout according to Claim 1 wherein the chute mounting means comprise means 34, 36; 48, 54, 58 for rotating the spout on the auger tube to a transport position.

3. A spout according to Claim 1 or 2 wherein the peripheral chute wall 16 includes inner and outer end portions 22, 18 that slope outwardly with respect to the end of the auger tube

4. A spout according to Claim 1, 2 or 3 wherein the tube mounting means comprise links 42 flexibly suspending an uppermost extension tube 40 from

the chute and flexibly suspending the remainder of the extension tubes 40 in sequence from the uppermost extension tube.

5. A spout according to Claim 1, 2, 3 or 4 wherein the chute mounting means include a strap 34; 54 engaged with the chute and extending partially around the auger tube, and means 36; 58 for tightening the strap on the auger tube.

6. A spout according to any preceding Claim wherein the chute has an inner end 30; 50 for engaging the auger tube, the inner end having at least one removable portion 30; 52 for mating with auger tubes of different sizes.

7. A spout according to Claim 6, wherein the removable portion comprises an inner end wall 30 of substantially crescent shape for engaging an underside of the auger tube.

8. A spout according to Claim 6, wherein the inner end is substantially tubular and the at least one removable portion includes a set of cylindrical rings 52 of different diameters to fit over the auger tube.

9. A spout according to any preceding Claim wherein the chute includes a hood 48 engageable over the end of the auger tube.

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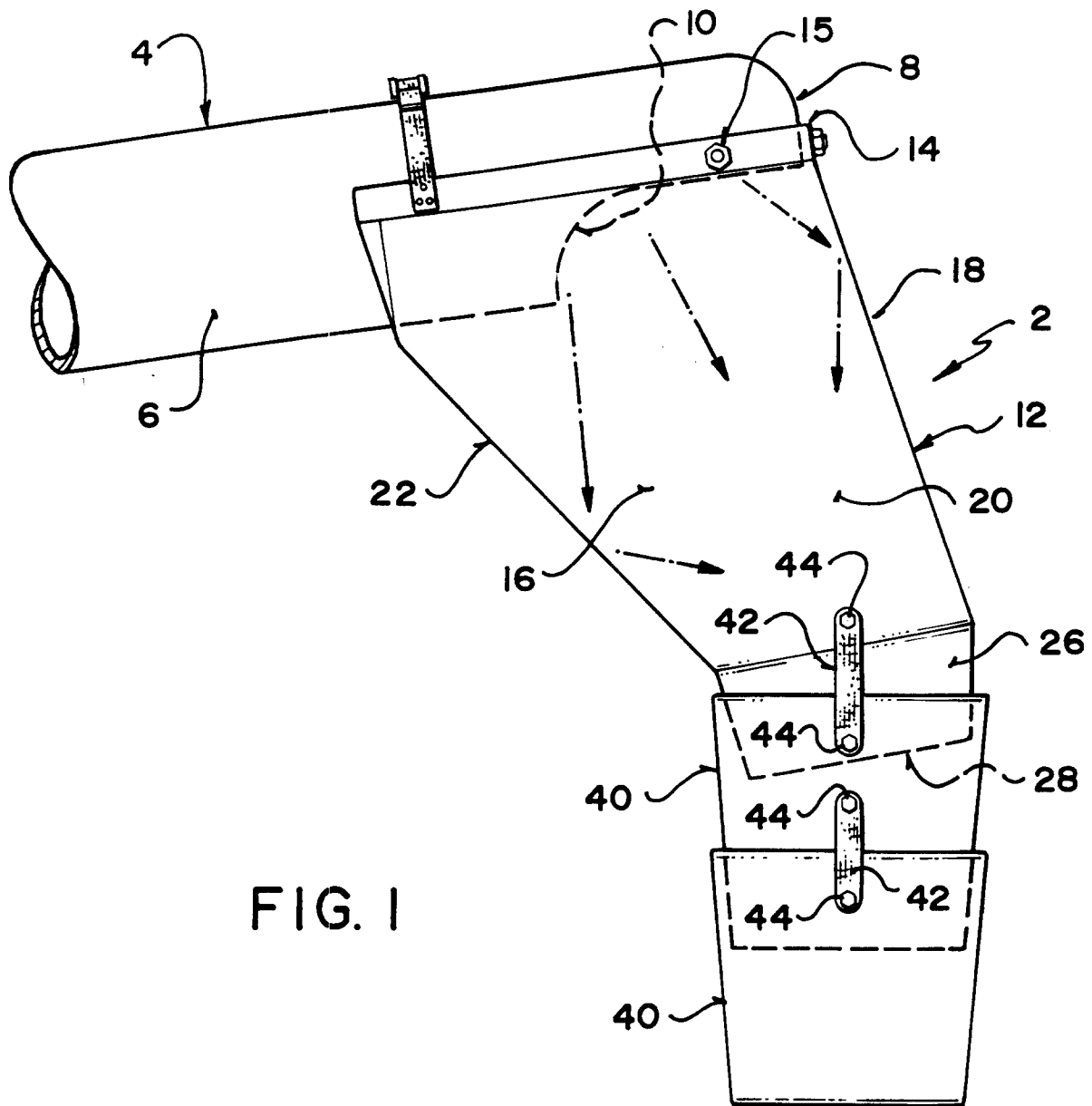


FIG. 1

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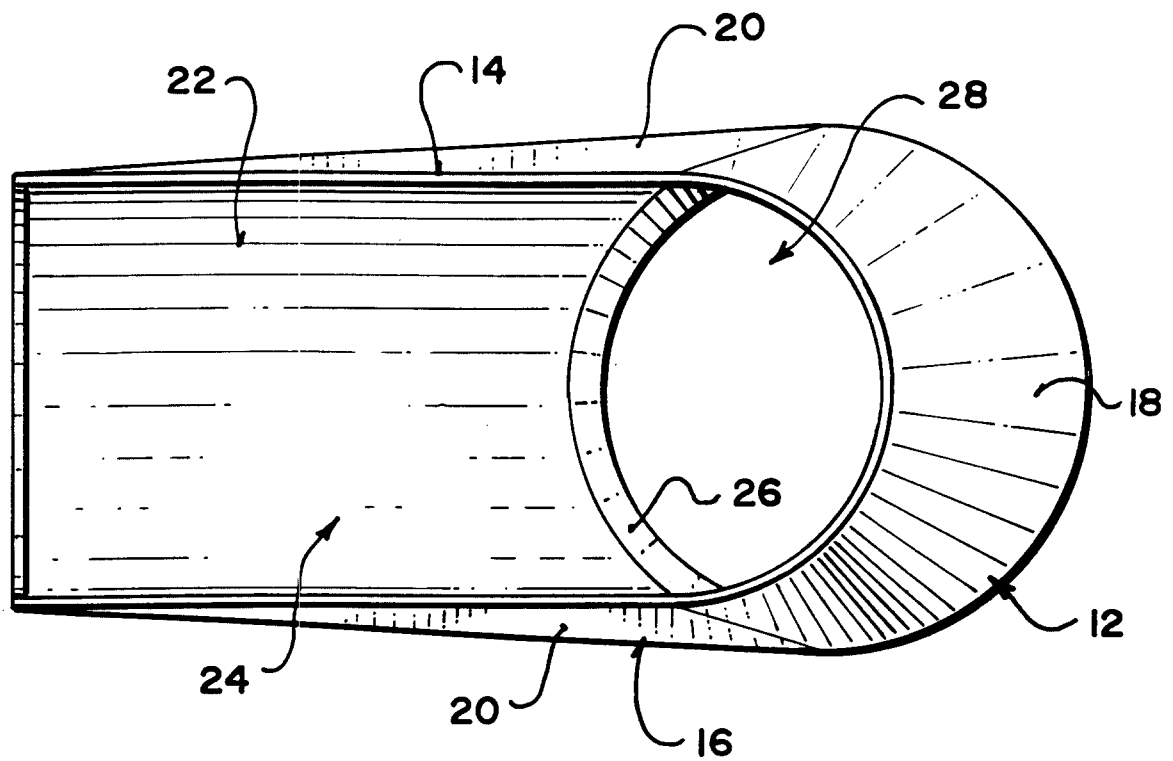


FIG. 2

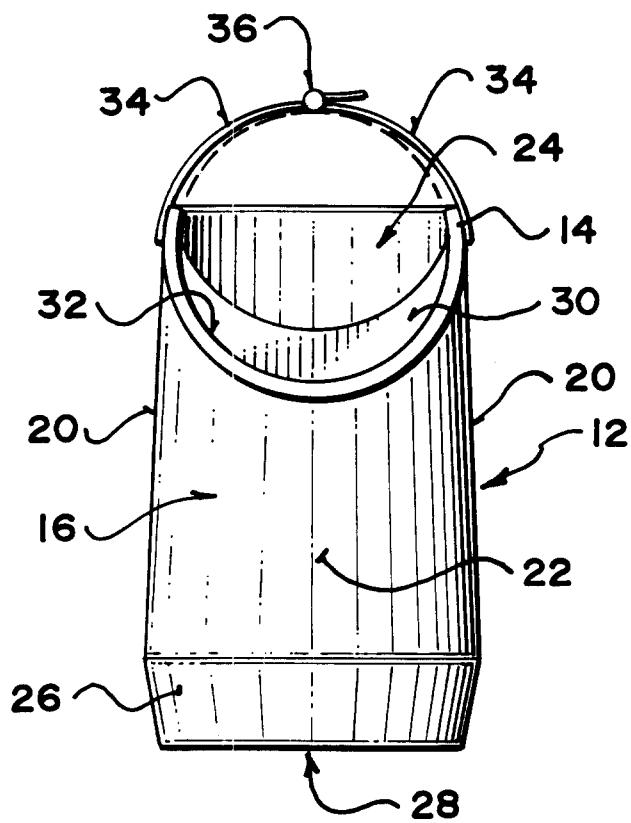


FIG. 3

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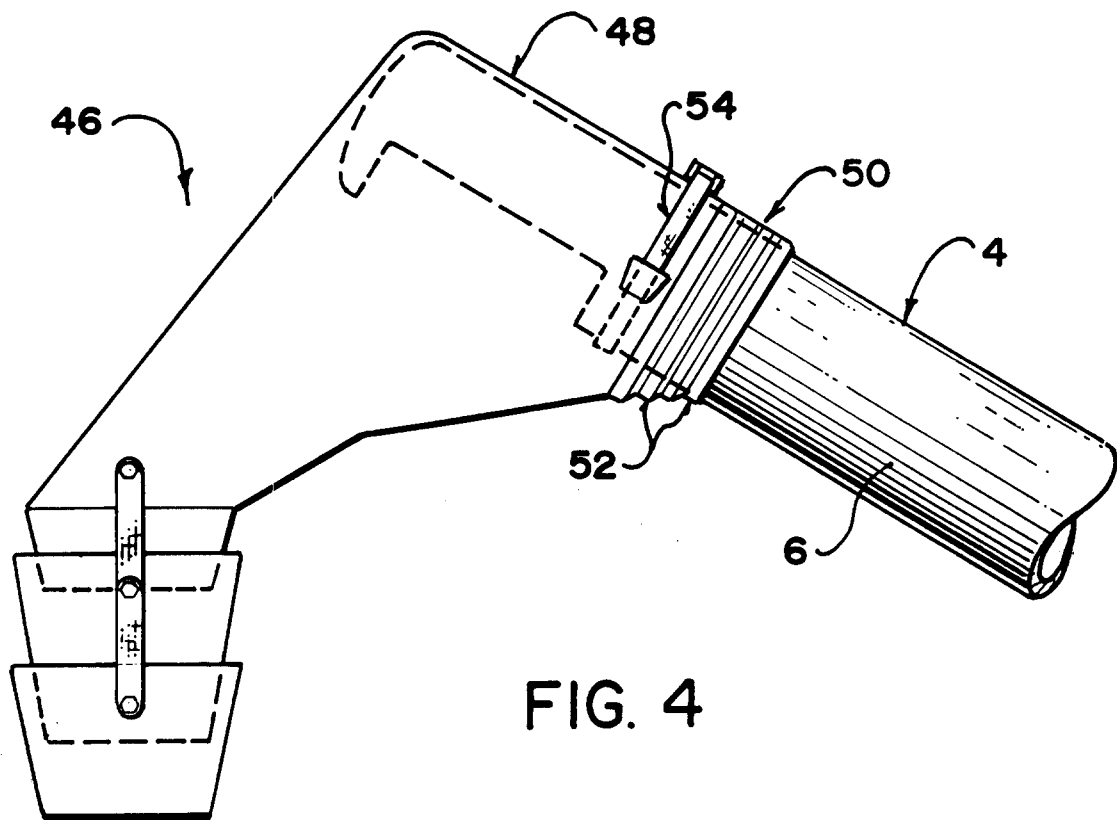


FIG. 4

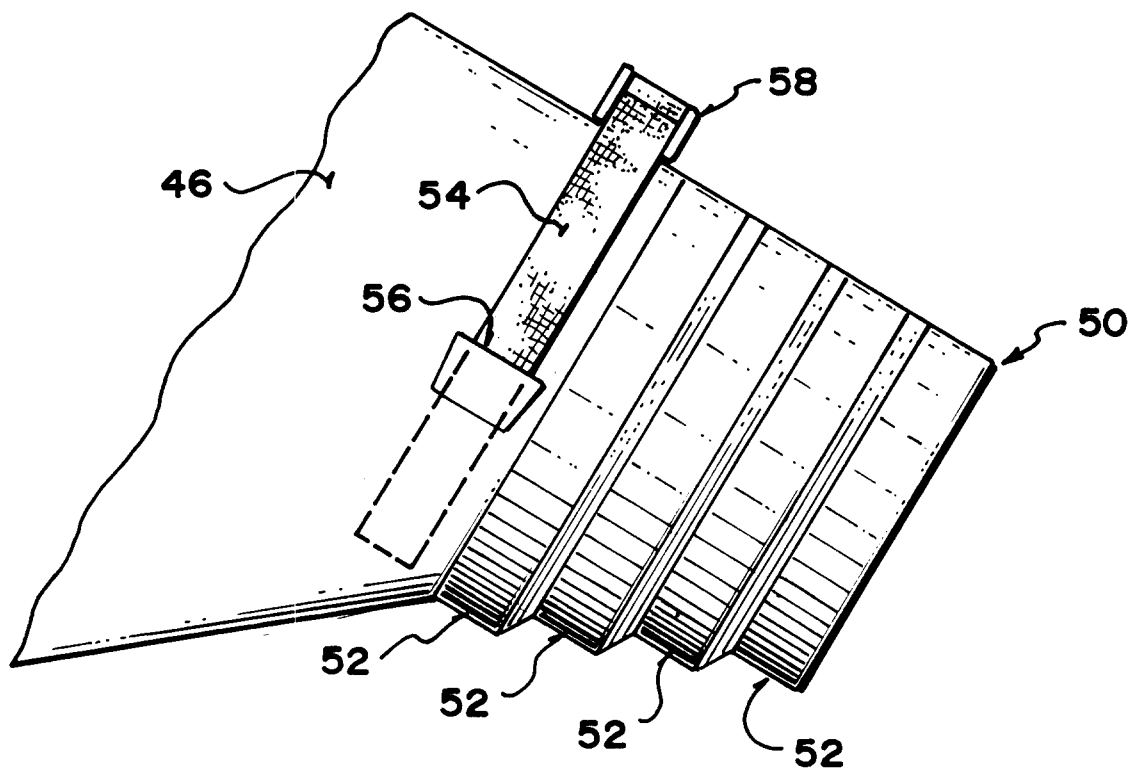


FIG. 5

