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LINER FOR SPOUTS AND THE LIKE

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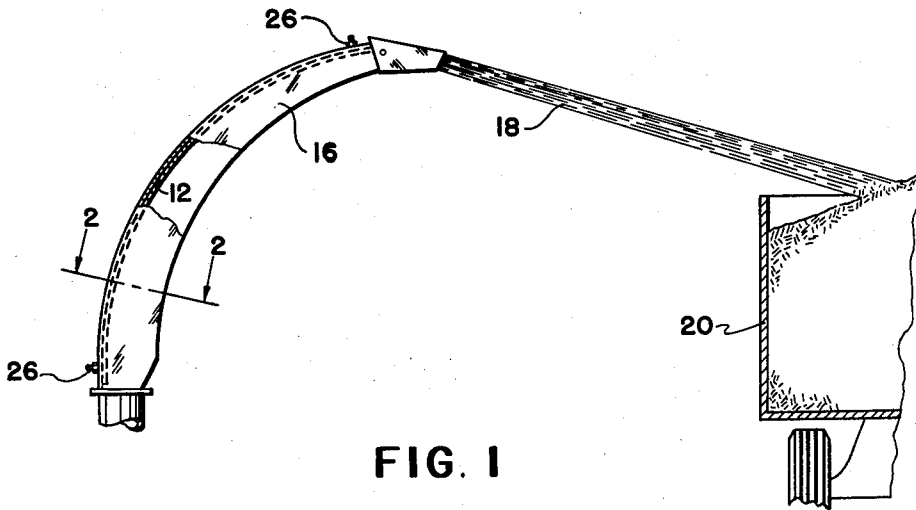


FIG. 1

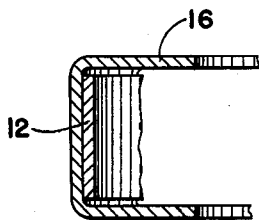


FIG. 2

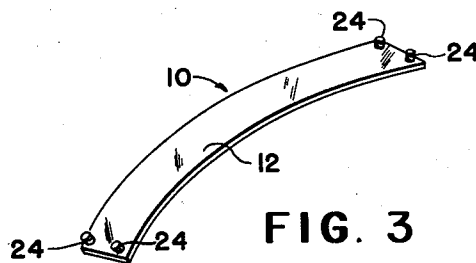


FIG. 3

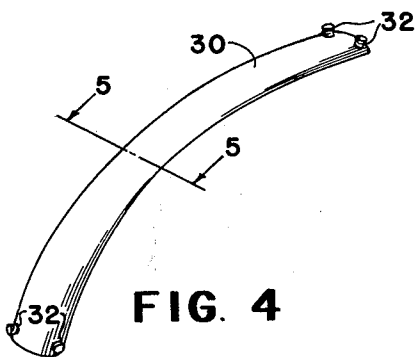


FIG. 4

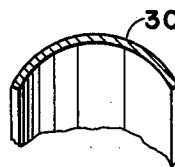


FIG. 5

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LINER FOR SPOUTS AND THE LIKE

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1 Claim. (Cl. 302—64)

This invention relates to a liner, and in a more particular aspect to a removable or replaceable liner constructed and positionable to receive wear in a curved spout or the like.

Various types of equipment, and particularly farm equipment, utilize spouts, deflectors or the like to direct a crop or other article in the desired direction. Many of these spouts or the like are curved over the major portion of their length and the material passing therethrough is blown or forced therethrough at a relatively high rate of speed and the abrasive nature of the article passing tends to rapidly wear one surface or portion of the spout or the like. Since the spouts are ordinarily relatively expensive this wear is very costly to the operator and causes the entire spout structure to be frequently replaced, often as much as once or twice a week.

In accordance with the present invention, a liner is provided which is positionable within the spout or the like in an area of greatest wear so that the liner will be engaged by material moving therethrough and thus the wear normally occurring on the spout will be received by the liner. The liner of the invention is relatively inexpensive and is easily replaced.

The replaceable liner of the invention is preferably a plate which is elongated and of size to substantially fill the wearing area of the article in which it is to be mounted. Means are provided to mount the liner in the desired position and such can conveniently be provided by passing stud bolts or the like through end portions of the liner and through the article in which it is to be mounted, the bolts receiving nuts or the like to maintain the liner in place. In preferred specific embodiments of the invention, the liner is shaped to snugly engage the wearing surface of the article in which it is to be mounted. The plate is preferably made of a smooth metallic material.

Accordingly, it is an object of the invention to provide an improved wearing surface.

Another object of the invention is to provide a replaceable liner for discharge spouts or the like to reduce wear on the spout.

Another object of the invention is to provide a relatively inexpensive and easily constructed disposable liner.

Another object of the invention is to provide new liners and the like particularly constructed to be mountable in forage spouts of various constructions.

A further object of the invention is to provide new means for substantially extending the life of a forage cutter spout or the like.

Various other objects, advantages and features of the invention will become apparent to those skilled in the art from the following description, taken in connection with the accompanying drawings, in which:

FIG. 1 is an application view of a spout of a forage cutter, ensilage loader, etc. with a liner therein in use and discharging ensilage, forage or the like onto a vehicle.

FIG. 2 is an enlarged cross section view taken along the line 2—2 of FIG. 1.

FIG. 3 is an isometric view of a preferred specific embodiment of the replaceable liner of the invention.

FIG. 4 is an isometric view of another preferred specific embodiment of the liner of the invention.

FIG. 5 is an enlarged cross section view taken along the line 5—5 of FIG. 4.

The following is a discussion and description of a pre-

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ferred specific embodiment of the new liner of the invention, such being made with reference to the drawings whereon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring now to the drawings in detail and to FIG. 3 in particular, a preferred embodiment of the replaceable liner of the invention is shown generally at 10 and includes a plate 12 preferably formed of a metallic member. Plate 12 in the preferred embodiment is an elongated, smooth member and is generally flat in transverse cross section. Plate 12 is preferably bent from one end portion to the other end portion thereof in a smooth, continuous arc. Plate 12 can be formed by rolling or other suitable metal forming operations. The plate 12 is shaped so that it will snugly fit into and engage the portion of a forage cutter or the like spout subject to greatest wear.

FIGS. 1 and 2 illustrate a forage cutter spout 16 which is generally channel-shaped in transverse cross section and which is curved from one end portion to the other end portion on the outer circumference thereof so that forage or the like 18 entering through the lower or bottom portion as shown in FIG. 1 will be deflected from a generally vertical movement to a generally horizontal movement as illustrated. The forage 18 leaving the spout is normally received by a wagon, truck or the like 20 for transportation to suitable storage facilities. The member 16 can be a spout or discharge chute of any particular type, including forage cutters, ensilage loaders, various field harvesters, cutters and the like. Also, such discharge spouts or chutes are used in other fields or areas and it is to be understood that the invention applies equally as well to these structures.

Various means can be used to mount the liner 10 in the desired position within the spout 16. In the preferred manner illustrated in the drawings, a plurality of stud bolts 24 are provided and two of such are passed through and rigidly secured to the liner 12 in each end portion thereof, the bolts preferably being mounted rigidly therein such as by welding or the like. The ends of the bolts 24 extend from one surface of the liner 12 and such are passed through apertures in the spout 16 and will receive nuts 26 to rigidly and removably mount the liner in the desired position.

When initially installing a liner of the type described in the invention with a spout 16, a suitable stencil or pattern can be made and positioned across the outer surface of the spout 16 to mark the location of the apertures or openings through which the bolts 24 project. This will make installation of the liner very accurate.

When mounted in the spout 16, the liner 12 will preferably snugly engage the inner surface of the spout 16 as best illustrated in FIGS. 1 and 2. Thus, the deflection usually obtained by the use of the spout without the liner will not be effected. Furthermore, since the liner or plate 12 has a smooth, arcuate surface there will be no tendency for the forage 18 or the like passing through the spout 16 to be sprayed or undesirably deflected by interruptions on the surface of the liner. This, of course, is quite important when the spout 16 is spaced a substantial distance from the truck, wagon or the like 20.

A further embodiment of the invention is illustrated in FIGS. 4 and 5 of the drawings. In this embodiment, the liner includes a plate 30 which is preferably an elongated metallic member and is curved from one end portion to the other end portion thereof to fit a spout, etc., in the manner described in connection with FIGS. 1-3. The arcuate curvature of the member 30 is chosen so that same snugly engages the inner surface of the discharge spout or the like in which it is mounted. In FIGS. 4 and 5, the liner 30 is also curved or arcuate in transverse

cross section as best shown in FIG. 5. This liner will be particularly suitable for use with those spouts or chutes which are arcuate in cross section and in which some difficulty is experienced in mounting a flat plate or the like. The liner 30 can be constructed by stamping or other suitable metal forming operations.

Suitable mounting means are also provided to secure the liner 30 in position and such are illustrated as being stud bolts 32 or the like which can be welded or otherwise secured to the member 30 and project therefrom from one surface thereof, such also passing through the spout or the like in which the liner is to be mounted to be engaged by bolts or nuts to secure same in the desired position. Here, as in the previous embodiment described, the liner 30 preferably extends substantially the entire length of the spout and desirably extends at least to the lower edge portion thereof so that the lowermost edge will not present an obstruction to deflect or spray the ensilage or the like being received in the chute.

The liners 10 and 30 of the invention can be formed of any suitable material and are preferably formed of wear resisting materials, such as metals, including steel or alloys thereof. The gauge of the material used is selected in accordance with the material passing through the spout or chute, expected uses, etc., and will normally be from 8 to 14 gauge steel alloys. This, of course, will be variable depending upon the application and wear encountered. Also, while the dimensions of the liners and spouts vary depending upon applications, the liner when used on forage cutters will normally be approximately 5 to 10 inches wide and 40 to 60 inches long. The dimensions can, of course, be changed to suit any particular application.

While the invention has been described in connection with preferred specific embodiments thereof, it will be understood by those skilled in the art that this description is intended to illustrate and not to limit the scope of the invention, which is defined by the claim.

We claim:

In a discharge spout for a forage harvester or the like, an elongated arcuate unitary spout body portion which is generally U-shaped in cross section and includes spaced side walls and a back wall forming a passage for the harvested material, said back wall being smooth and continuous and constituting an arcuate deflector for said material and being subject to wear by the abrasive effect of said material passing thereover, the improvement comprising a unitary elongated arcuate continuous smooth surfaced liner plate for the inner face of said back wall and covering the same throughout substantially the entire length of the spout and over substantially the entire width and length of the back wall and conforming to the cross sectional shape of the back wall and abutting the same in contacting relation therewith over substantially the entire surface areas of the back wall and liner plate, a pair of laterally spaced screw-threaded studs welded to the outer face of the liner plate near each end thereof and near the ends of the spout and back wall and projecting outwardly from the outer face only of the liner plate, whereby the inner face of the liner plate is smooth and unobstructed and free of recesses or projections to provide a continuous uninterrupted wear surface, said back wall of the spout having through apertures registering with and receiving said studs and said studs extending beyond the outer face of said back wall, and nuts carried by the studs outwardly of the back wall and bearing upon the outer face of the back wall and securing the liner plate firmly to the back wall in contacting relation therewith and allowing ready removal of the liner plate from the spout.

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