This invention relates to air seal feeders, or so-called "vacuum feeders" such as are used in cotton gins to separate cotton or other material from a conveying air stream and is intended to provide the provision of improved mounting means for the flaps or sealing strips employed in such feeders.

In recent years the conditions under which vacuum feeders in cotton gins operate have grown increasingly severe. The size of ginneries has increased and with it the volume of material handled; the advent of stripping and mechanically picking cotton have brought about the handling of more abrasive and large foreign matter with the cotton; the ever growing use of heated air in drying the cotton makes it necessary for them to withstand temperatures around 300° F.; and the oil now being added to seed cotton before ginning, all contribute to the breaking down and wearing out of the rubber composition flaps or sealing members.

Heretofore in this art, so far as I am aware, it has been the custom to mount the flaps or sealing members between the dividing strips or staves of the feeder wheel by bolts spaced some 3 or 4 inches apart so that in order to replace all the flaps in a bucket wheel eight feet long, it has required the removal and replacing of some 200 to 250 bolts together with the removal and replacing of the flaps. Due to the limitations as to space and the temperature of the feeder this has been a time consuming job which involved the further great expense of shutting down the gin until the work was completed.

In accordance with my invention I provide an improved mounting for the flaps in which they are bolted between holders which are formed in the staves or dividing members of the wheel. Improved means are provided for restraining the holders against outward and tangential movement and for inserting and withdrawing them through one end of the feeder housing.

Apparatus embodying features of my invention is illustrated in the accompanying drawing, forming a part of this specification, in which:

Fig. 1 is a transverse sectional view;  
Fig. 2 is an end view;  
Fig. 3 is a detail transverse sectional view taken along line III—III of Fig. 4;  
Fig. 4 is a detail elevational view of one end of a stave with its sealing strip taken along the line IV—IV of Fig. 1 and drawn to a larger scale; and,  
Fig. 5 is a detail sectional view showing a modification of my invention.

Referred to the drawing for a better understanding of my invention I show a casing or housing 10 of conventional design which is open at the top, indicated at 11, and at the bottom, indicated at 12. Mounted in the housing 10 is a wheel 13 which is secured by means of set screws 14 and 15 to a shaft 16. The wheel is divided by means of staves 20, each formed by a pair of metal strips 17 and 18 secured together and which, in cooperation with the housing, form pockets into which the material drops and is carried around by the rotation of the wheel to fall out at the bottom, as is well understood. The strips 17 and 18 may be formed from a single sheet of metal which also forms the surface of the wheel 13 between the staves.

The radial edges or ends of the strips 17 are bent outwardly as shown at 21, then upwardly as shown at 22, and then inwardly as shown at 23 to form a channel. Likewise, the strips 18 are each bent outwardly as shown at 24, then upwardly as shown at 26, and then inwardly as shown at 27 to form a channel facing the channel in the strip 17. The adjacent strips 17 and 18 are bolted together back to back as shown at 28 so that there is formed by the facing channels, at the radial edges of the staves 20, a slot 29 which extends from end to end of the wheel.

At 31 I show a flap which is carried by each stave 20 and which, in accordance with my invention, I secure between a pair of flap carriers 32 and 33. Each of the flap carriers 32 and 33 has a lower outturned flange 34 and an upper outturned flange 36, the upper flange being curved over, rather than turned abruptly, and is not subject to the flap 31 to abrupt bending over a sharp edge. The flap 31 is secured between the holders 32 and 33 by means of a plurality of bolts 38 which pass through the holders and the flaps at regular intervals from end to end of the staves. The bolts 38, with their nuts 39, are of such size as to engage the inturned flanges 23 and 27 of the staves to limit relative radial outward movement between the holders and the staves. The clearances between the bolts 37 and the flanges 23 and 27 as well as between the carriers 32 and 33 and the sides of the slot 29 are such as to permit easy relative longitudinal movement between the flap holders and the slot 29, in which, at the same time, limit the relative outward or radial as well as tangential movement between the two to a minimum. The flaps 31 are made a little longer than the inside length of the housing 10 and thus bend backwards slightly in the housing to form an end seal and hold the carriers centered endwise.

In addition to the flaps 31 I provide relatively short flashing strips 40 which are secured to the staves 20 by means of the bolts 28 and by plates 45, as shown in Figs. 3 and 4. The strips 40 bear against the ends of the housing to prevent leakage of air around the ends of the wheel. In addition to the radial edges, a wide based slot 51 with outwardly flaring sides 52 and 53 at the top. In accordance with this modification, instead of employing holders
as previously described, I form the flaps 31' by molding, preferably from synthetic rubber capable of withstanding a relatively high temperature, and reinforced with a suitable fabric 54 which may be made of nylon or other relatively strong threads. The inner edge of the flap 31' is formed with a relatively wide base 56 which fits into the wide slot 51 formed between the staves 17' and 18' and thus holds the flap against radial or outward movement. Should one of these flaps become worn or damaged to the extent that it has to be renewed, it may be removed by pulling it longitudinally out of its slot and be replaced by a new flap. Other means for securing the flaps for ready endwise removal will suggest themselves to those skilled in the art.

From the foregoing it will be apparent that I have devised an improved vacuum feeder in which the sealing flaps are mounted on the staves with interlocking joints capable of relative longitudinal movement but limiting relative radial and tangential movement between the flaps and the staves, and which are readily removable and replaceable through one end of the casing.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a vacuum feeder including a housing and a rotary wheel having a plurality of radial longitudinally extending staves forming with the wheel a plurality of sockets with sealing flaps along the edges of the staves, a pair of facing metal strips forming each of the staves, a pair of facing channels along the radial edges of the strips forming a longitudinal slot in each stave, and flap retaining means carried by the flaps forming interlocking joints with the slots relatively movable longitudinally of the staves and limiting radial movement of the flaps.

2. Apparatus as defined in claim 1 in which the flap retaining means comprises metal holders between which the flaps are retained and which interlock with the slots in the staves.

3. Apparatus as defined in claim 1 in which the flaps are provided with integral means along their inner edges which interlock with the slots in the flaps.

4. In a vacuum feeder including a housing open at top and bottom and a wheel in the housing with radial staves extending longitudinally and dividing it into feeder compartments together with sealing flaps along the radial edges of the staves to cooperate with the housing, a pair of facing metal strips forming each of the staves, a pair of facing channels along the radial edges of the strips forming a longitudinal slot in each stave, a pair of outturned channels adapted to fit in said slot and slide longitudinally therein, and a sealing flap secured between the outturned channels.

5. In a vacuum feeder including a housing open at top and bottom and a wheel in the housing with radial staves extending longitudinally and dividing it into feeder compartments together with sealing flaps along the radial edges of the staves to cooperate with the housing, a pair of facing channels along the radial edge of each stave forming a longitudinal slot, a pair of outturned channels adapted to fit in said slot and slide longitudinally therein, a sealing flap mounted between the outturned channels, and bolts securing the flaps to the channels and limiting relative radial and tangential movement between the outturned channels and the slots.

6. Apparatus as defined in claim 5 in which the upper flanges of the outturned channels are curved.

7. Apparatus as defined in claim 5 in which the sealing flaps are made slightly longer than the inside length of the housing whereby to form an end seal and limit lengthwise movement of the outturned channels.

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