

Oct. 8, 1940.

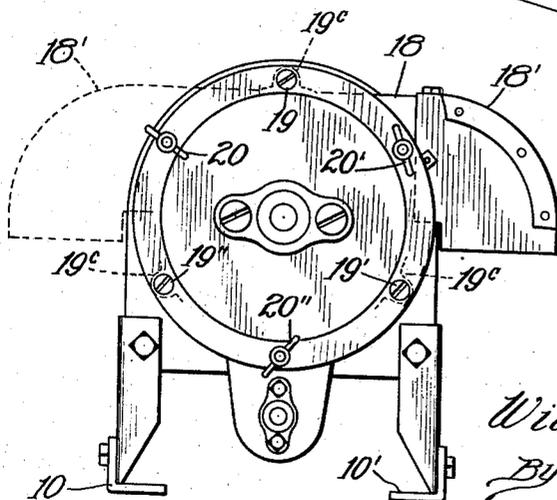
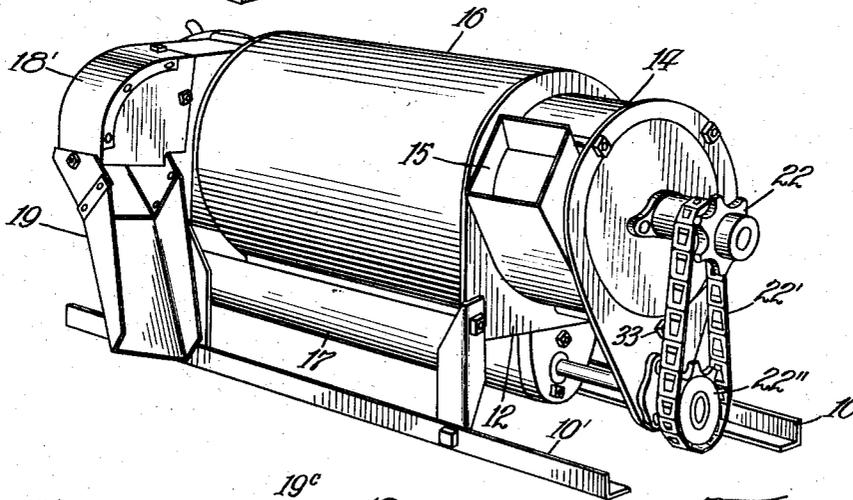
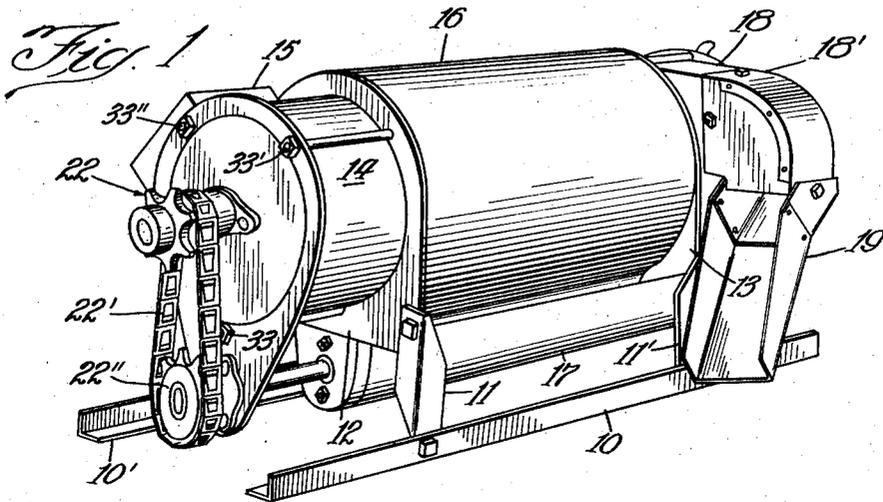
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2,216,914

GRAIN CLEANER

Filed June 30, 1938

4 Sheets-Sheet 1



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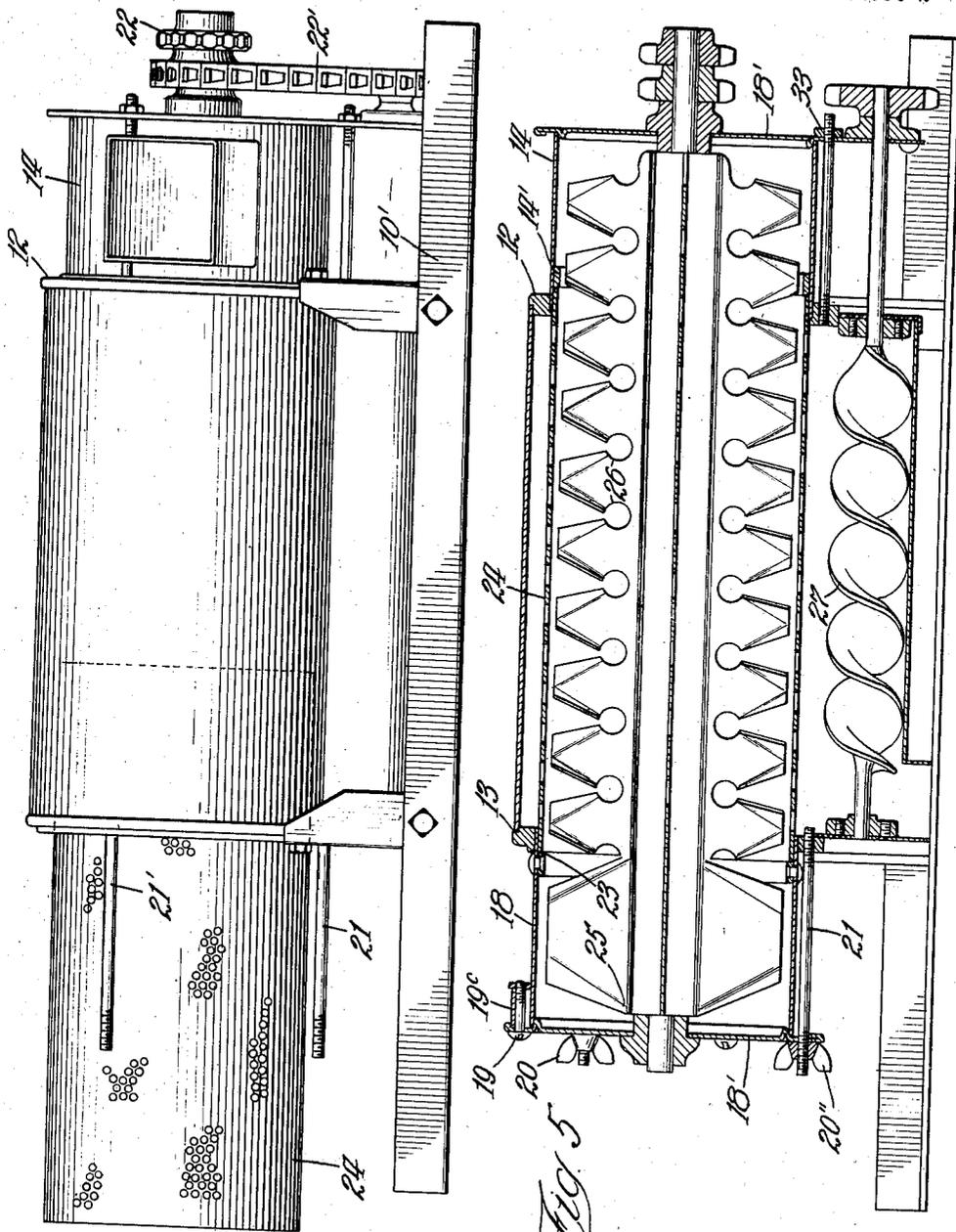


Fig. 4

Fig. 5

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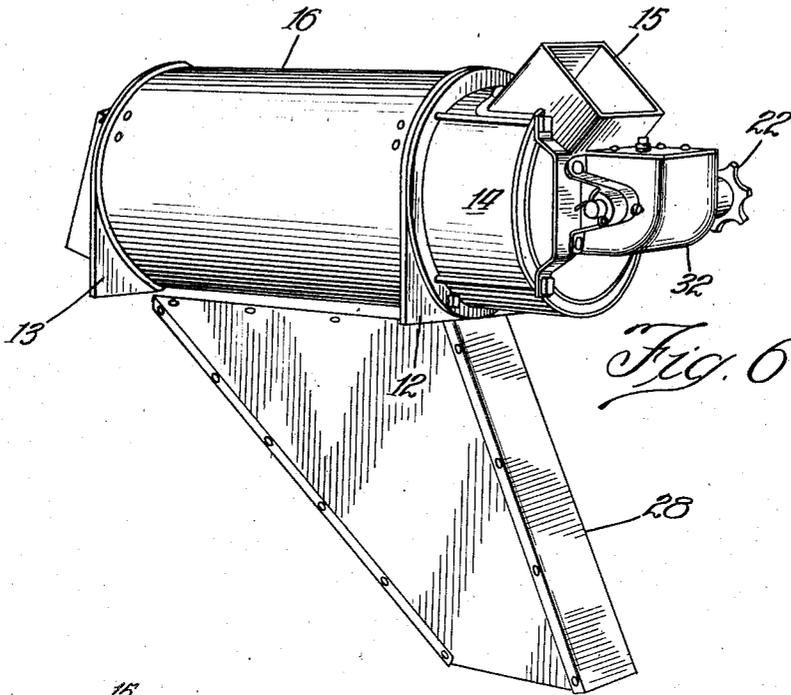


Fig. 6

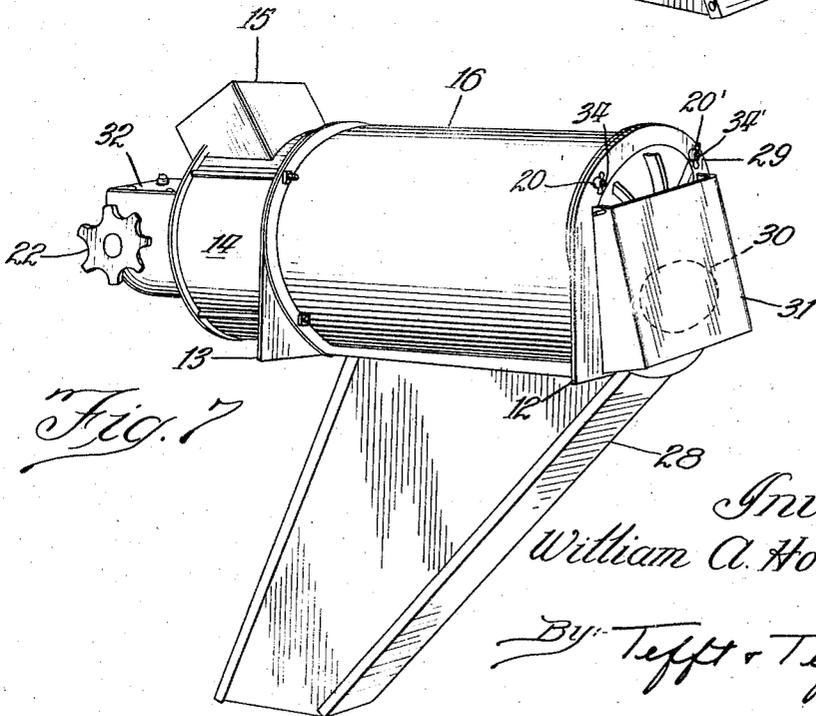


Fig. 7

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4 Sheets-Sheet 4

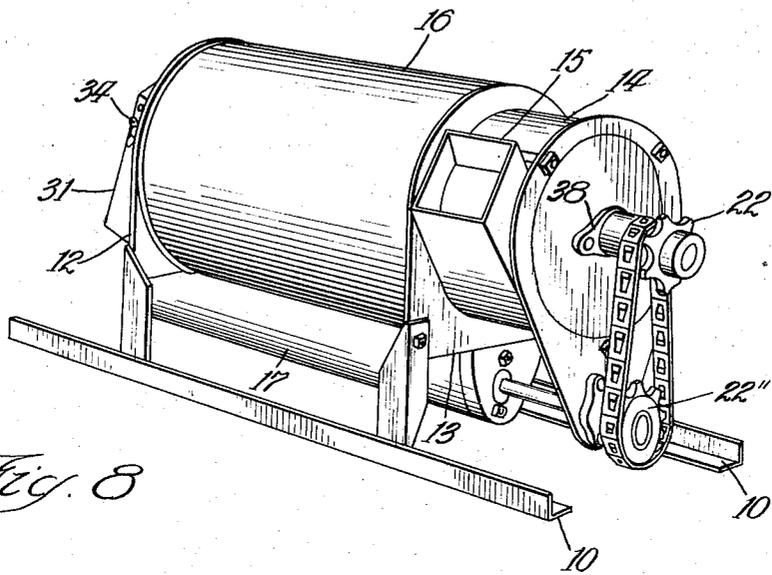


Fig. 8

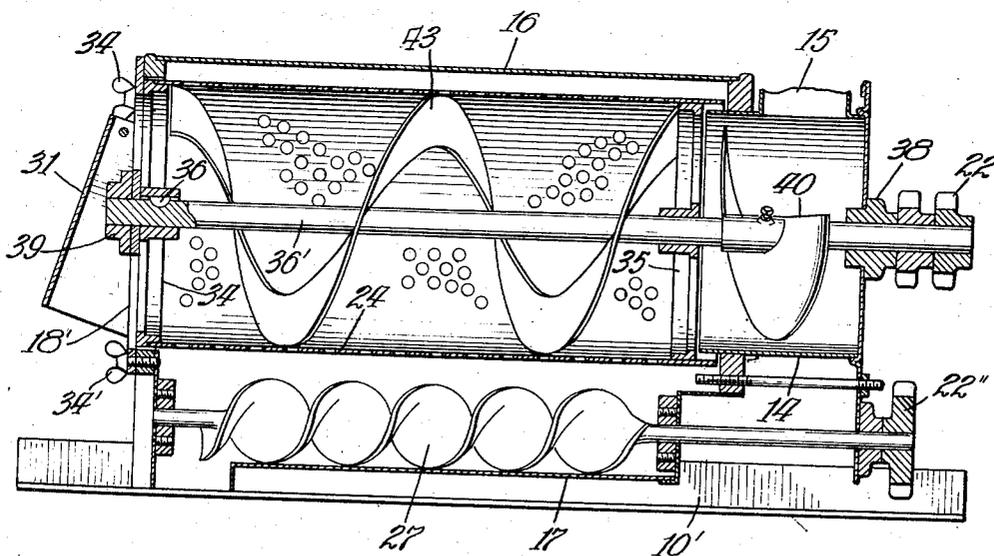


Fig. 9

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UNITED STATES PATENT OFFICE

2,216,914

GRAIN CLEANER

William A. Holtzman, Peoria, Ill.

Application June 30, 1938, Serial No. 216,653

3 Claims. (Cl. 209-240)

This invention relates to grain cleaners of the type used in connection with threshing machines and particularly to the newer type of combined grain harvesters and threshers.

Grain cleaners, as will be recognized, are old in the art of threshing. This invention has to do with improvements in the general structure of such devices as have been indicated as necessary by the adaptation of modern combined harvesters and threshers with the attending increase in capacities and speeds.

The effectiveness of this type of grain cleaner is dependent upon the cylindrical screen used as a separating means to remove extraneous matter such as weed seeds and the like from clean grain or other crops. These screens must be selected with great care as a screen of proper mesh size must be selected for the different types of grain and different kinds of crops. To be of greatest value, the cleaner must be made so that screens can be quickly interchanged, to install a screen of proper mesh for different kinds and conditions of crops.

The meshes or openings in the screen must be kept clean to provide proper cleaning capacity. It will be noted that screens of the full cylindrical type are best adapted for this purpose because in the full cylinder there are no offsets or projections which might start the building up of clogging matter. It will be noted further that a stationary cylindrical screen used in combination with the propelling type centrifugal rotor which sets up a scouring action of the grain on the screen, forces the dockage through the screen and keeps the screen meshes clean from the inside without the need of auxiliary brushes.

The particular object of this invention is to provide structure in grain cleaners whereby the screens may be quickly and completely removed for interchange with a minimum disturbance of other parts.

Another object is to provide a structure wherein the stationary screens may be accurately formed in a true cylinder which is the best structure for this kind of apparatus.

A still further object is to provide a structure wherein the members containing the grain inlet and discharge, or either of them, and the dockage discharge trough, are made as separate units from the main body of the cleaner. This permits the inlet and discharge openings to be assembled on either side of the cleaner body, or, with modifications in either of the members, the openings may be placed in the ends. This also allows the dockage discharge trough to be assembled in

various positions. This construction makes it possible to build a cleaner for the various models and types of combines with a number of interchangeable parts to accommodate these various models and types, which is a decided advantage from a manufacturing and inventory standpoint. The construction described above is applicable to cleaners with either the stationary or rotary type screens.

Now, referring to the drawings:

Fig. 1 is an isometric view of a grain cleaner with the inlet end in the foreground and the grain discharge chute on the outlet end on the opposite side to the inlet chute.

Fig. 2 is a reverse isometric view to Fig. 1 but with the outlet chute on the same side as the inlet chute.

Fig. 3 is an end view of the cleaner from the discharge end as of Fig. 2 but without the discharge chute. In dotted outline the discharge elbow location is shown as in Fig. 1.

Fig. 4 is a side elevation view showing the discharge housing removed and the separator screen partially removed.

Fig. 5 is a side elevation in section showing the various elements of the cleaner in their relations to one another.

Fig. 6 is an isometric view of my grain cleaner with revised locations of the inlet chute and the outlet chute, a dockage chute replacing the dockage screw conveyor.

Fig. 7 is a reverse isometric view of Fig. 6 with the outlet housing in the foreground.

Fig. 8 is an isometric view of a modified design of the grain cleaner similar to Fig. 2; and

Fig. 9 is a cross-sectional elevation view of the cleaner as shown in Fig. 8, showing the modifications of the structure including the rotary screen with spiral conveyor.

Now referring to Fig. 1. The numerals 10 and 10' designate angle iron rails on which the cleaner is mounted. Vertical support angle iron members 11 and 11' are attached to these rails and support the cast end frame members 12 and 13. The inlet housing complete is generally designated as 14 and the inlet chute as 15. A casing 16 is supported by the end frame members enclosing the interior rotor and screen drum. Similarly a casing 17 encloses the dockage auger. The discharge end casing is designated as 18, the discharge elbow as 18' and the discharge chute as 19.

The rotor 26 is of conventional form wherein the angular plates move the grain to and fro over the screen but generally drive it toward the

discharge end where the fan 25 discharges it through the housing 18, the elbow 18' and out the chute 19. The rotor and fan are driven by the drive sprocket 22. The rotor 26, the fan 25 and the dockage auger 27 are driven from the drive sprocket 22, the chain 22' and the chain sprocket 22''.

The foregoing structure as described is quite conventional in form and its operation is well known. Therefore, I have made no attempt to describe it in detail because it has no pertinency in the present invention.

The screen 24, as best shown in Fig. 5, is mounted in the end frame members 12 and 13 concentric with the rotor 26. The discharge housing 18 with the interior riveted rim 23, abuts the end of the screen 24 and holds it against the cast frame member 12 by means of the studs 21, 21' and 21'', and the wing nuts 20, 20' and 20''. It will readily be appreciated that by removing the wing nuts 20, 20' and 20'', the housing 18 can be removed and thereupon the entire cylindrical screen 24 may be removed bodily by sliding endwise as shown in Fig. 4.

The discharge housing 18 is covered on the end by the head member 18' by means of bolts 19 through the clips 19c riveted to the housing 18. It will thus be apparent that the housing 18 carrying the elbow 18' and the chute 19 can be readily detached from the main body of the cleaner or from one another and by rotating the housing with respect to the stud bolts 21 which are equally spaced or by substituting a different housing, the discharge elbow may be moved to different locations and the discharge chute 19 may be reversed, thus providing means whereby the discharge grain may be delivered to various locations.

The intake housing 14 abuts the cast frame member 12 and is held in place by the head member 18' by means of the stud bolts 21, 21' and 21'' and nuts 33, 33' and 33''. It will be readily appreciated that by removing the nuts 33, 33' and 33'' the housing 14 and head 18' may be rotated with respect to the stud bolts 21, or, by substituting a different housing or head, the intake spout may be moved to different locations, thus providing means whereby the grain may be taken into the cleaner at the most advantageous position. In order to make the inlet and discharge housings interchangeable, as well as to permit rotation of the same as above described, the stud bolts 21, 21' and 21'' are equally spaced and of the same size and length.

Now referring to Figs. 6 and 7. The general structure of the end plates 12 and 13, the housing 16, the screen 24 and the rotor 26 remain as best shown in Fig. 5. The fan 25 has been completely eliminated as well as the dockage screw 27. The inlet housing 14 has been revised to put the inlet chute on top and end of the housing, feeding the grain angularly into the end of the rotor 26. The drive of the rotor has been changed and the sprocket 22 now drives the rotor through bevel gears in a new gear case 32. The discharge housing 18 has been eliminated and in its place a plain end cap housing 29 replaces it. This housing is held in place by the studs 34, 34' and 34'', and wing nuts 20, 20' and 20''. This housing has an opening 30 through which the grain is directly discharged from under the pivoted door 31. In place of the dockage screw 27 and its housing 17 the angular chute 28, extending the full length of the housing 16, has been added. It will be well

understood that by this structure the grain may be fed directly into the chute 15 and out of the opening 30 while the dockage is gathered by the chute 28 and deposited by it separate from the grain. It will be recognized that this is a far simpler construction than that shown in Figs. 1 and 2 and in some applications has definite advantages.

Any combination of the grain intakes and discharges, also the dockage discharges shown in Figures 1 and 2, or 6 and 7, may be assembled on one cleaner to adapt it for best installation on the combine model to which it is to be attached.

Referring to Figures 8 and 9, this shows a modified structure of my grain cleaner with a rotary screen. The general structure is exactly similar to the structures heretofore described and will be well understood from the drawings.

The modifications have to do with the rotary screen, numeral 24, to which is attached an interior spiral conveyor 43. The rotary screen is mounted on spoked wheels 34 and 35. The wheel 34 is driven by a removable Woodruff type key 36 in the shaft 36'. It will be noted that the keyway extends through the hub of the wheel 34. The shaft 36' is journaled in bearings 38 and 39, permitting the screen 24 with the integral spiral conveyor 33 and the spiral feeder member 40 to be rotated by the shaft 36' by means of the sprocket 22. It will readily be appreciated that by removing the wing nuts 34 and 34', the head member 18' can be removed and thereupon the complete screen member 24 can be slid endwise off the shaft 36' and thus removed for replacement or inspection.

It will be understood that the grain as it enters the opening 15 is fed by the spiral feeder member 40 into the screen member 24, whereupon it is moved endwise and discharged out of the door 31. This movement is naturally aided by the spiral 33. It will be appreciated that by this structure I have shown a modified design from those previously described wherein the screen member is rotated rather than stationary. Although I prefer the stationary screen, I desire to show this rotary screen modification wherein the same principles of my invention are applied.

Having thus described my invention, I now claim as new:

1. In a grain cleaner, a cleaner housing having open end frames with symmetrically identical mounting means, inlet and discharge heads with mating mounting means permitting interchangeable removable mounting on either end frame, rotor mechanism reversibly and removably mountable in said heads to move grain in a scouring movement from one end to the other, and a cylindrical cleaning screen enveloping said rotor in the housing slidably removable by dismounting the discharge head.

2. In a grain cleaner, a cleaner housing having open end frames with symmetrical identical mounting means, inlet and discharge heads having rotor bearings and mating mounting means permitting interchangeable removable mounting on either end frame, rotor mechanism reversibly and removably mountable in said heads to move grain in a scouring movement from one end to the other, and a cylindrical cleaning screen enveloping said rotor in the housing slidably removable by dismounting the discharge head.

3. In a grain cleaner, a cleaner housing having open end frames with symmetrically identical mounting means, inlet and discharge heads having rotor bearings and mating mounting means

5 permitting interchangeable removable mounting on either end frame, chute connections in said heads symmetrically reversible to either side of the housing, rotor mechanism reversibly and removably mountable in said heads to move grain in a scouring movement from one end to the other, a cylindrical cleaning screen enveloping

said rotor in the housing slidably removable by dismantling the discharge head and inlet and discharge chutes attachable to said heads whereby chutes may be positioned to fit various styles of combines.

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