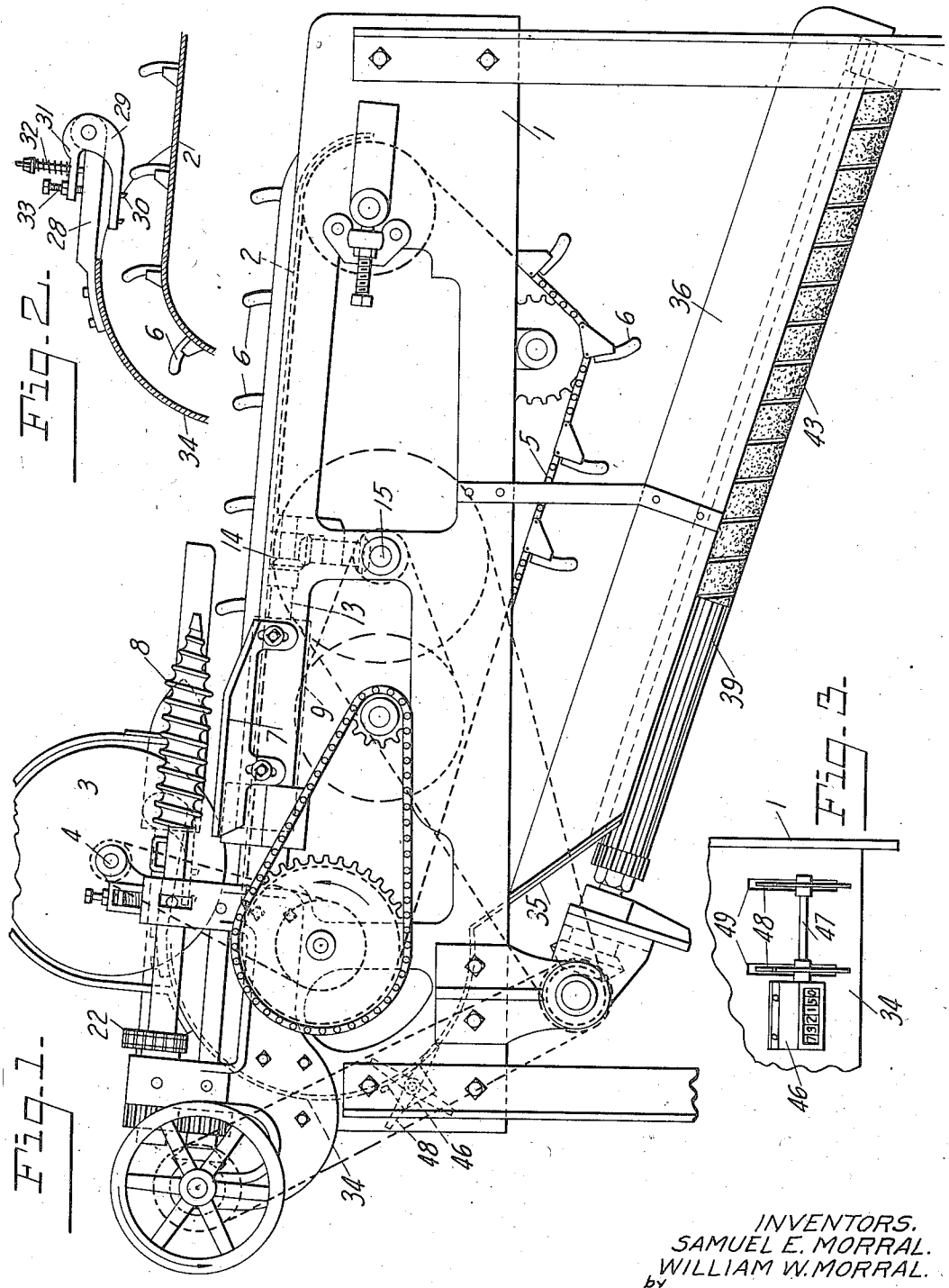
Feb. 18, 1936. S. E. MORRAL ET AL 2,031,277

CORN HUSKING MACHINE

Filed June 26, 1931 3 Sheets-Sheet 1



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Feb. 18, 1936. S. E. MORRAL ET AL 2,031,277

CORN HUSKING MACHINE

Filed June 26, 1931 3 Sheets-Sheet 2

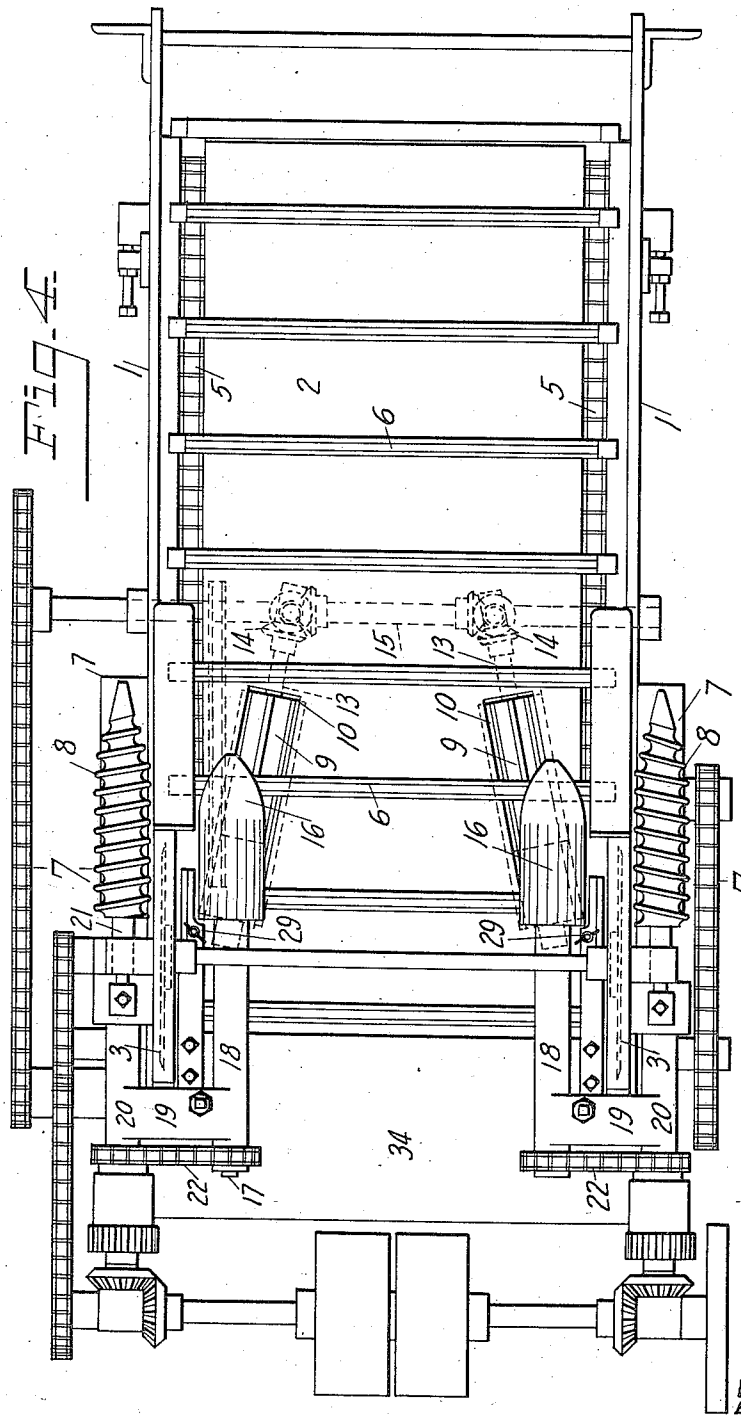


Fig. 4

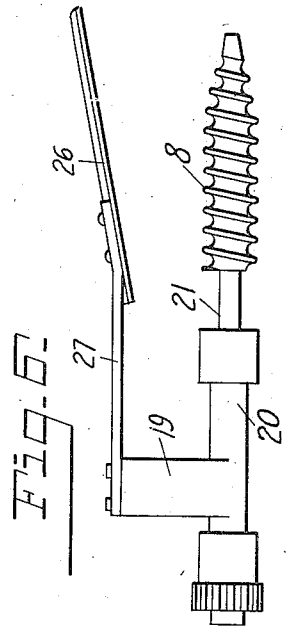


Fig. 6

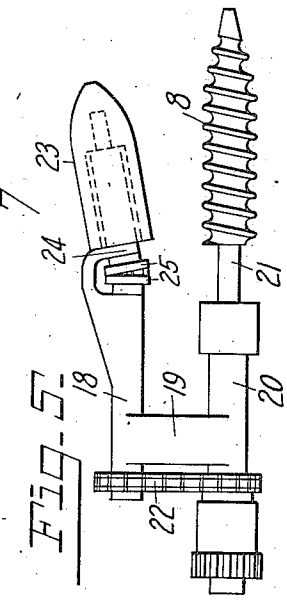


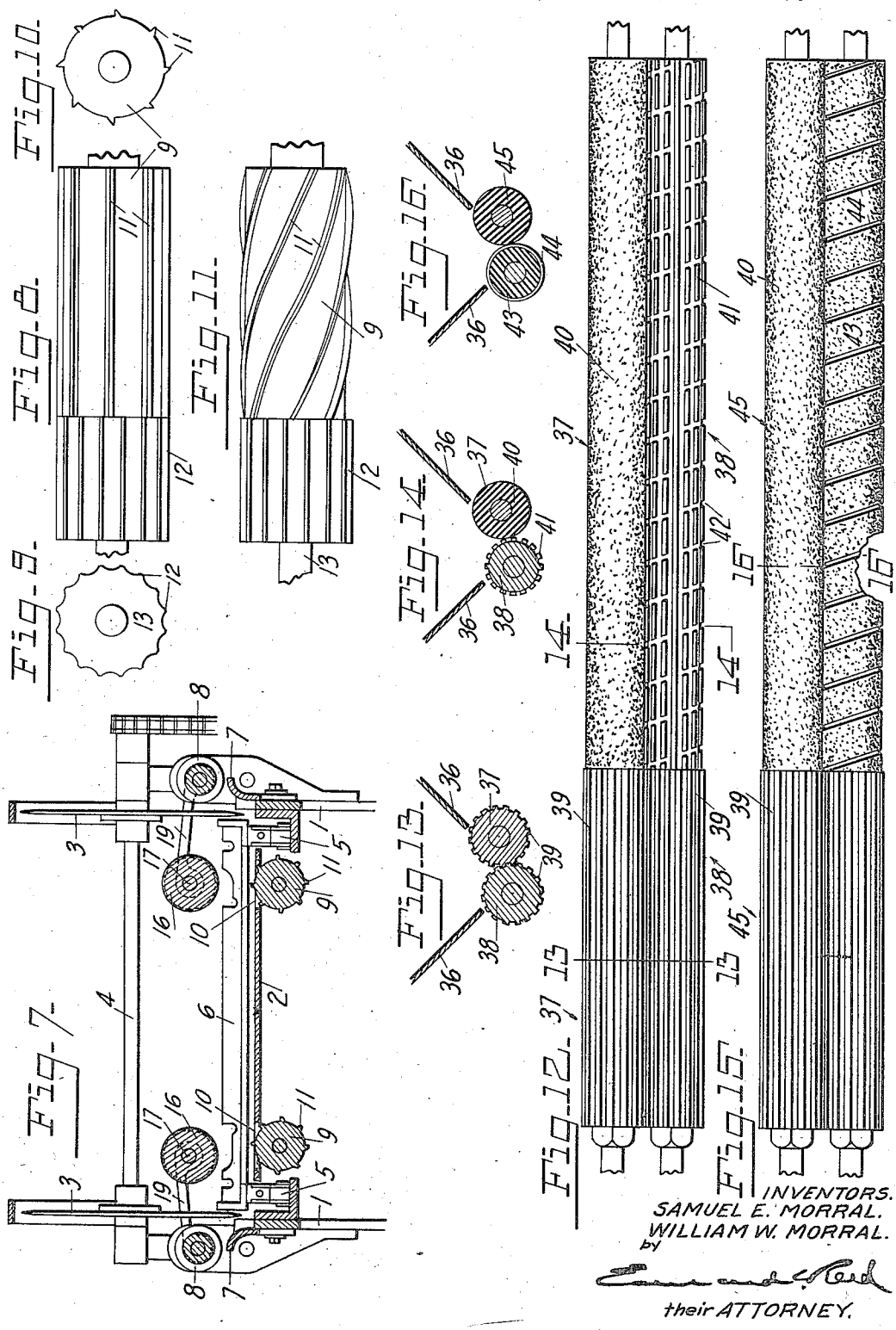
Fig. 5

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Feb. 18, 1936. S. E. MORRAL ET AL 2,031,277

CORN HUSKING MACHINE

Filed June 26, 1931 3 Sheets-Sheet 3



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Patented Feb. 18, 1936 2,031,277

UNITED STATES PATENT OFFICE

2,031,277

CORN HUSKING MACHINE

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Application June 26, 1931, Serial No. 547,078

16 Claims. (Cl. 146—84)

This invention relates to corn husking machines and is designed more particularly for husking green corn.

Green corn husking machines usually comprise a device for removing the butt from the ear before it is delivered to the husking mechanism, a conveyor for moving the ears past the butt removing device, a gaging device to properly locate the butts with relation to the butt removing device and some means for moving the ears into engagement with the gaging device while they are being advanced by the conveyor.

One object of the present invention is to provide means for quickly and positively moving the ears into engagement with the gaging device irrespective of the length of the ear or the distance which it may be spaced from the gaging device.

A further object of the invention is to associate with the butt removing device improved means for loosening the husks on the ears as they are fed to the butt removing device.

A further object of the invention is to provide such a machine with husking rollers of such a character that a single pair of rollers will operate effectively to first remove the husks from the ear and to then remove the silk and thin inner husks which may remain on the ears, without bruising or injuring the grains of corn.

A further object of the invention is to provide such a machine with means for counting the ears which pass through the same.

Other objects of the invention will appear as the mechanism is described in detail.

In the accompanying drawings Fig. 1 is a side elevation of a machine embodying our invention; Fig. 2 is a sectional detail view showing the husk loosening device in elevation; Fig. 3 is a detail view of the counter and its actuating device; Fig. 4 is a plan view of the machine; Fig. 5 is a detail view of a slightly modified form of pressure roller; Fig. 6 is a detail view of another form of the pressure device; Fig. 7 is a transverse sectional view taken on the line 7—7 of Fig. 4; Fig. 8 is an elevation of one of the positioning rollers; Fig. 9 is an elevation of the left hand end of the roller of Fig. 8; Fig. 10 is an elevation of the right hand end of the roller of Fig. 8; Fig. 11 is a side elevation of a slightly modified form of positioning element; Fig. 12 is a plan view of a pair of husking rollers; Fig. 13 is a section taken on the line 13—13 of Fig. 12; Fig. 14 is a section taken on the line 14—14 of Fig. 12; Fig. 15 is a plan view of a slightly modified form of husking roller; and Fig. 16 is a section taken on the line 16—16 of Fig. 15.

In these drawings we have illustrated one embodiment of our invention and have shown the same as applied to a corn husking machine of a well known type. As here illustrated this machine comprises the main frame 1 having near the top thereof a longitudinal table 2. Mounted on the main frame 1, near the rear or discharge end thereof, is a butt removing device which, in the present machine, comprises a rotary cutter 3 mounted on a shaft 4. The present machine is a double husker and comprises two complete sets of butt removing and husking mechanisms, arranged near the respective sides of the machine, and a single conveyor advances the ears to the two sets of butt removing and husking mechanisms. The two sets of devices are substantially identical in construction and we will therefore describe but one set and it will be understood that this description applies to both sets. The rotary cutter 3 is arranged at the side of the table and the ends of corn are delivered thereto by a suitable conveyor which, in the present machine, comprises two endless chains 5 arranged at the respective sides of the table and carrying a series of flights 6 which move over the table and advance the ears one at a time to the butt removing device. It will be understood that the ears are spaced on the table between the flights of the conveyor, and transverse to the line of movement of the conveyor, either by hand or by suitable feeding mechanism. Mounted on the main frame, just in advance of the butt removing device, is a gaging device which is here shown as comprising a fixed bar 7 above which is supported a spiral roller 8. The spiral roller is spaced from the bar 7 a distance sufficient to permit the stem and a portion of the butt of the ear to enter the space between the two gaging members and the spiral then advances the butt as the body of the ear is fed forward by the conveyor.

For the purpose of quickly and positively moving the ears into engagement with the gaging device, while they are being advanced by the conveyor, we have mounted beneath the conveyor a positioning roller 9 the upper portion of which extends through an opening 10 in the table 2 and projects above the upper surface of the table a distance sufficient to enable it to engage the ear and move the same transversely to the table. The positioning roller is arranged obliquely to the line of movement of the conveyor and has its forward end spaced a substantial distance from the gaging device while its rear end is relatively close to and overlaps the butt removing

device. This oblique arrangement of the positioning roller not only enables the same to engage all the ears regardless of their length or of their positions with relation to the conveyor but also causes the ears to be moved very quickly into engagement with the gaging device. The positioning roller may be of any suitable form but we prefer to provide the same with a roughened or ribbed surface to enable it to act more effectively on the ear. As shown in Figs. 8 to 10 the roller is provided with two sets of ribs. The portion of the roller which first engages the ears has a circumferentially arranged series of ribs **11** which, in the present instance, extend for about two-thirds the length of the roller and have their edges sharpened to bite into the husk of the ear. These ribs are spaced substantial distances apart and arranged to impart a quick initial movement to the ear. The rear end of the roller is provided with ribs **12**, in the present instance formed by fluting this end of the roller, and these ribs are spaced apart a distance somewhat less than the distance between the ribs **11** and in cooperation with a suitable pressure device serve to press the ear very firmly into engagement with the gaging device and to hold the same during the butt removing operation. The roller may be driven in any suitable manner. It is here shown as carried by a shaft **13** which is connected by beveled gearing **14** with a transverse shaft **15**. The pressure device may take various forms and is preferably in the form of a driven roller **16** having its forward end tapered. As shown in Figs. 4 and 7 this roller is carried by a shaft **17** which is mounted in an elongated bearing **18** supported by an arm **19** which has at its other end a tubular portion or bearing **20** which embraces the shaft **21** which carries the gaging roller **8** and is freely movable thereon, thus permitting the pressure roller to rise and fall and accommodate itself to ears of different diameters. The roller is driven by a chain **22** from the shaft **21**. The weight of the roller and its supporting structure is usually sufficient to exert the desired pressure on the ear and we have not found it necessary to use a spring or other means for increasing this pressure. As shown in Fig. 4 the pressure roller is mounted on an axis substantially parallel with the line of movement of the conveyor, while in Fig. 5 we have shown the roller at **23** as extending obliquely to the line of movement of the conveyor and substantially parallel with the positioning roller **9**. As there shown, the shaft for the pressure roller is divided into two parts and the bearing member **18** is provided with a bracket spaced from the end thereof and forming a bearing **24** for that part of the shaft which carries the roller. The two parts of the shaft may be operatively connected in any suitable manner as by means of a universal joint **25**. While the pressure device preferably comprises a positively driven roller it is not necessary that the roller shall be driven nor is it necessary that the pressure device should be in the form of a roller and in Fig. 6 we have shown the pressure device in the form of a bar **26** arranged substantially parallel with the positioning roller **9** and carried by a yieldable arm **27** which is mounted on the arm **19** in place of the bearing **18**.

It is desirable that the husks on the ear should be somewhat loosened before they are delivered to the husking mechanism and for this purpose we have mounted on a fixed part of the structure a bracket **28** which extends between the pressure roller **16** and the butt removing device. Pivotally mounted on the forward end of this bracket is an arm **29** which extends rearwardly substantially parallel with the table **2** and has on its lower surface prongs **30** adapted to engage the husks and tear the same loose. Connected with the arm **29**, and, if desired, formed integral therewith, is a second arm **31** which extends rearwardly above the bracket **28** and is acted upon by a spring **32** which serves to press the pronged end of the arm **29** into engagement with the ears. The movement thus imparted to the arm **29** may be limited by an adjustable stop, such as a set screw **33**. The arrangement of this husk loosening arm is such that it will engage the ears after they have moved past the forward edge of the cutter **3** and will very effectively loosen the husks to facilitate their engagement by the husking rollers.

The husking mechanism comprises a pair of husking rollers which are rotated in opposite directions so that the husks will be gripped in the bite of the rollers and pulled from the ear. As here shown, these rollers are supported on the lower part of the main frame beneath the table **2** and are inclined forwardly and downwardly so that the ears will move along the same by gravity. As the ears are moved past the butt removing device they are delivered into a chute **34** which is curved so as to carry the ears to and deliver them onto the husking rollers. At the lower end of the chute the latter is provided with a sharply inclined portion **35** which will cause the ears to turn and assume a longitudinal position on the husking rollers between the guard plates **36**. The husking rollers are shown more particularly in Figs. 12 to 14, in which figures one roller, **37** is on an axis slightly higher than the axis of the other roller, **38**. These rollers are provided at their upper or ear receiving ends with roughened surfaces of hard material and preferably these portions are formed of metal and provided with intermeshing longitudinal ribs **39** which firmly grip the husks and pull the same from the ear. These ribbed portions of the rollers may be comparatively short and, in the present instance, comprise approximately one-third the length of the husking rollers. The lower portions of the rollers, that is the parts lying beyond the ribs **39**, are of such a character that they will engage and remove the silks and any pieces of fine inner husk which may adhere to the ears without bruising the grains or otherwise injuring the ears. Preferably one or both of the rollers have these lower portions provided with yieldable surfaces. As shown in Figs. 12, 13 and 14, the roller **37** has its outer surface of rubber, as shown at **40**, and this rubber surface extends from the ribbed portion of the roller to the discharge end thereof. The opposed portion of the roller **38** may be of metal and is provided with a roughened surface which preferably consists of a series of longitudinal ribs **41** which are intersected by a spiral groove **42**. This roughened surface of the hard roller will press the silks and pieces of husk into the yieldable surface of the other roller and thus cause the same to be very firmly gripped and effectively removed from the ears. Further, the spiral groove **42** will displace and remove any bits of cob or hard material which may enter the bite of the rollers, thus preventing these hard pieces from injuring the rubber roller. In that form of husking rollers shown in Figs. 15 and 16 the rollers are provided at their receiving ends with the intermeshing ribs **39**, as above described, and the remaining portions of both rollers are

of yieldable material, preferably rubber. Preferably the surfaces of the rubber rollers are stippled or slightly roughened to increase their gripping action and one of the rollers 43, is provided with a spiral groove 44 for the purpose of removing bits of hard material from the bite of the rollers. The other roller, 45, has its surface uniform but slightly roughened as above described.

It is often desired to maintain a record of the number of ears which are husked and for this purpose we have provided the machine with a counter which is actuated by the ears as they pass through the chute 34. As here shown, an ordinary counter 46 is mounted on the chute 34 and the shaft 47 of the counter extends alongside the outer surface of the chute and has mounted thereon one or more star wheels 48 which move through slots 49 in the wall of the chute. The arrangement of the star wheels is such that the arms thereof will be moved successively through the respective slots and into the path of the ears passing through the chute, so that each ear in its movement through the chute will engage one or both of the star wheels and impart a quarter rotation to the shaft 47, which will cause the operation of the counter.

While we have shown and described one embodiment of our invention we wish it to be understood that we do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to its length past said butt removing device, and a gaging device to properly locate the butt of the ear with relation to said butt removing device, a driven roller arranged beneath said conveyor to engage said ear as it is advanced by said conveyor and move the same toward said gaging device, said roller being mounted obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, a supporting member pivotally mounted at one side of said conveyor, extending inward above said conveyor and having bearings at its inner end, shafts journaled in the respective bearings, one of said shafts being substantially parallel with said roller, means to operatively connect said shafts one to the other, a pressure roller carried by the last mentioned shaft, and means for driving the other shaft.

2. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to its length past said butt removing device, and a gaging device to properly locate the butt of the ear with relation to said butt removing device, a driven roller mounted alongside of said gaging device obliquely to the line of movement of said conveyor and arranged to engage said ear and move the same toward said gaging device while said ear is being advanced by said conveyor, said roller having two sets of longitudinal ribs, the ribs at the forward end thereof being spaced apart greater distances than the ribs at the rear end of said roller.

3. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to its length past said butt removing device, and a gaging device to properly locate the butt of the ear with relation to said butt removing device, a driven roller mounted alongside of said gaging device obliquely to the line of movement of said conveyor and arranged to engage said ear and move the same toward said gaging device while said ear is being advanced by said conveyor, said roller having two sets of longitudinal ribs, the ribs at the forward end thereof being spaced apart greater distances than the ribs at the rear end of said roller, and being arranged in spiral formation.

4. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to its length past said butt removing device, and a gaging device to properly locate the butt of the ear with relation to said butt removing device, a driven roller arranged beneath said conveyor to engage said ear as it is advanced by said conveyor and move the same toward said gaging device, said roller being mounted obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, said roller having two sets of longitudinal ribs, the ribs at the forward end thereof being spaced apart distances greater than the distances between the ribs at the rear end of said roller, and a pressure device arranged above the rear end of said roller to press said ear into engagement therewith.

5. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to its length past said butt removing device, and a gaging device to properly locate the butt of the ear with relation to said butt removing device, a driven roller arranged beneath said conveyor to engage said ear as it is advanced by said conveyor and move the same toward said gaging device, said roller being mounted obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, a pressure device mounted above said conveyor to press said ear into firm engagement with said roller, an arm pivotally mounted between said pressure device and said gaging device and having prongs to engage and loosen the husks on said ear as the latter is advanced by said conveyor, and means acting on said arm to press said prongs into engagement with said ear.

6. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to its length past said butt removing device, a gaging device to properly locate the butt of the ear with relation to said butt removing device, and means to move said ear toward said gaging device as it is advanced by said conveyor, a husk loosening device comprising a pivoted arm arranged above and extending substantially parallel with said conveyor and having prongs to engage the husk on said ear, a second arm rigidly secured to the first arm, and a spring acting on said second arm to press the first mentioned arm into engagement with said ear.

7. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to the length of said ear past said butt removing device, and a gaging device to properly locate the butt end of the ear with relation to said butt removing device and having its rear end adjacent to said butt removing device, a driven roller arranged beneath said conveyor to engage said ear as it is advanced by said conveyor and move the same toward said gaging device, said roller being mounted obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, and a roller located above said

driven roller and mounted parallel with said gaging device to cooperate with the lower roller to move the ear toward the gaging device, one of the rollers being yieldable toward and from the other roller.

8. In a machine comprising a butt removing device, a conveyor to move an ear of corn transversely to the length of said ear past said butt removing device, and a gaging device to properly locate the butt end of the ear with relation to said butt removing device and having its rear end adjacent to said butt removing device, a driven roller arranged beneath said conveyor to engage said ear as it is advanced by said conveyor and move the same toward said gaging device, said roller being mounted obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, and a driven roller mounted above said conveyor obliquely to the line of movement of said conveyor and arranged parallel with the lower driven roller to cooperate with said lower roller to move an ear of corn toward said gaging device, said upper roller being yieldable toward and from the lower roller.

9. In a machine comprising a butt removing device, a conveyor having a flight to move an ear of corn transversely to the length of said ear past said butt removing device, and a gaging device to properly locate the butt end of the ear with relation to said butt removing device, a driven roller arranged beneath said conveyor to engage said ear as it is advanced by said conveyor and move the same toward said gaging device, said roller being mounted obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device to cause the same to press said ear into engagement with said flight, and a second roller mounted above said driven roller and arranged substantially parallel with the line of movement of said conveyor to cooperate with said driven roller to move the ear toward said gaging device, one of said rollers being yieldable toward and from the other roller.

10. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device and with its rear end overlapping said butt removing device, and means for rotating said roller in a direction to move said ear toward said gaging device and to hold said ear against the adjacent flight of said conveyor while said ear is being acted upon by said butt removing device.

11. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device and with its rear end overlapping said butt removing device, a pressure device mounted above said conveyor to engage said ear and hold the same in firm contact with said roller, and means for rotating said roller in a direction to move said ear toward said gaging device and to hold said ear against the adjacent flight of said conveyor while said ear is being acted upon by said butt removing device.

12. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, means for rotating said roller in a direction to move said ear toward said gaging device and to press said ear against the adjacent flight of said conveyor, and means for holding said ear in firm contact with said roller, the rear portion of said roller being so arranged that it will be in operative engagement with said ear when the latter engages said butt removing device.

13. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, means for rotating said roller in a direction to move said ear toward said gaging device and to press said ear against the adjacent flight of said conveyor, and means for holding said ear in firm contact with said roller.

14. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, means for rotating said roller in a direction to move said ear toward said gaging device and to press said ear against the adjacent flight of said conveyor, and a second roller arranged above the first mentioned roller and substantially parallel with the line of movement of said conveyor, one of said rollers being yieldable one toward the other.

15. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater

distance from said gaging device, a second roller arranged above the first mentioned roller to hold said ear in firm contact therewith, and means for rotating said rollers and to move said ear toward said gaging device and to press said ear against the adjacent flight of said conveyor, one of said rollers being yieldable with relation to the other.

16. In a machine comprising a butt removing device, a conveyor having flights to move ears of corn transversely to the length of said ears past said butt removing device, and a gaging device to properly locate the butt of each ear with relation to said butt removing device, a roller mounted beneath said conveyor alongside of said gaging device to engage an ear of corn which is being advanced by said conveyor, said roller extending obliquely to the line of movement of said conveyor with its forward end spaced the greater distance from said gaging device, means for rotating said roller in a direction to move said ear toward said gaging device and to press said ear against the adjacent flight of said conveyor, and a pressure device yieldably mounted above and substantially parallel with said roller to hold said ear in firm contact with said roller.

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