J. H. O. KEMP.

FRUIT GRADER.

APPLICATION FILED JULY 5, 1913.

1,103,970. Patented July 21, 1914.

Fig. 1.

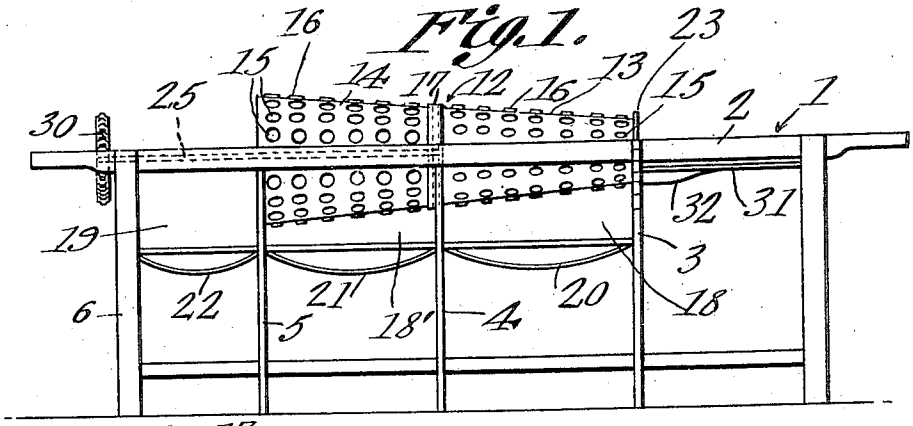


Fig. 2.

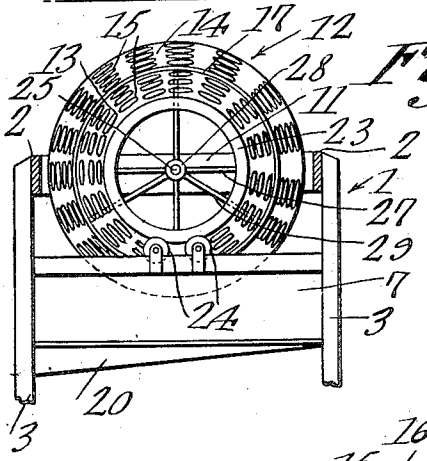


Fig. 4.

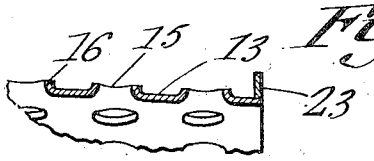
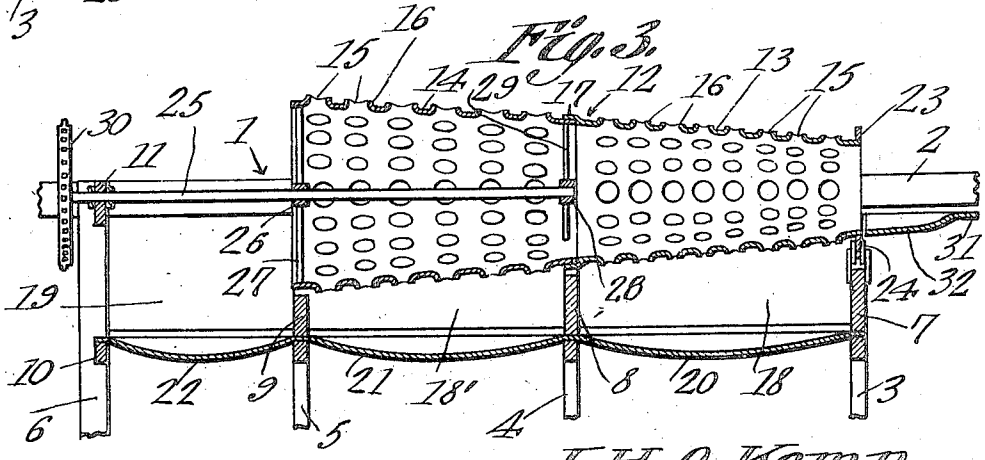


Fig. 3.



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FRUIT-GRADER.

1,103,970. Specification of Letters Patent. Patented July 21, 1914.

Application filed July 5, 1913. Serial No. 777,571.

To all whom it may concern:

Be it known that I, JOHN HENRY O. KEMP, a citizen of the United States, residing at Charles Town, in the county of Jefferson and State of West Virginia, have invented a new and useful Fruit-Grader of which the following is a specification.

The present invention appertains to a fruit grader, and aims to provide a novel and improved device of that character.

One of the objects of the present invention is to utilize a frusto-conical shell rotatable about a horizontal axis, and provided with openings graduated in size from the smallest end of the shell to the largest end, in order that the fruit or commodities to be graded, may be run into the smallest end of the shell, whereby the various sizes of fruit or other articles will precipitate or gravitate through the respective openings, or will be discharged out of the largest end of the shell.

The present invention also contemplates the provision of a novel shell of the character indicated, and means for rotatably supporting the same, to best carry out the functions desired.

A further object of the present invention is to provide in connection with a perforated shell of the nature indicated, a suitable framework for supporting the shell, embodying compartments for receiving the various sizes of fruit, and provided with fabric bottoms or aprons sloping to one side of the frame for discharging the various grades or sizes of fruit.

With the foregoing general objects outlined and with other objects in view, which will be apparent as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiment in the accompanying drawing, wherein:—

Figure 1 is a side elevation of the improved apparatus. Fig. 2 is a front end view thereof, parts being broken away and parts being removed. Fig. 3 is a central vertical longitudinal section of the apparatus, parts being broken away. Fig. 4 is a sectional detail of the receiving end of the shell.

In carrying out the invention, reference being had in detail to the drawing, there is provided a suitable frame 1, the detail structure of which may be varied according to the circumstances. As illustrated, the frame 1 embodies the two sets of side standards 3, 4, 5 and 6 supporting the side rails or beams 2 at their upper ends. Between the respective pairs of standards or legs 3—3, 4—4, 5—5, and 6—6, are secured the cross bars 7, 8, 9 and 10, the said bars being disposed below the rails 2 or below the upper ends of the standards. The rear standards 6 are connected at their upper ends by a cross piece or bar 11.

The frusto-conical shell has been designated generally by the numeral 12, the same being disposed longitudinally between the side beams or rails 2, and having its axis disposed substantially horizontal. The shell 12 is of a relatively small taper, its smallest end being disposed forwardly, and the largest end being disposed rearwardly. The ends of the shell 12 preferably terminate above the respective cross bars or pieces 7 and 9, the intermediate portion of the shell standing above the cross piece or bar 8. The shell 12 embodies forward and rear sections 13 and 14, respectively, which have suitably arranged openings or apertures 15 throughout their surfaces. The edges of the openings are struck outwardly as at 16, to provide outstanding rims or flanges around the openings. The openings 15 of the forward section 13 are of relative small diameter, while the openings 15 of the rear section 14 are relatively large, so that the openings of the shell are graduated in size from the forward end of the shell to its rear or delivery end. The forward end of the section 14 is slipped or telescoped into the rear end of the section 13, the rear end of the section 13 being preferably slightly enlarged, as at 17, to receive the adjoining end of the section 14, and in order that the interior of the shell will be flush at the joint of the sections.

The cross pieces 7, 8 and 9 may be in the form of partitions or dividing walls forming the compartments or cells 18 and 18′ below the respective sections 13 and 14 of the grading shell. A compartment 19 is also provided in rear of the cross piece or partition 9 at the delivery or rear end of the shell.

A textile sheet or apron 20 is secured between the cross pieces or partitions 7 and 8 to form a bottom for the compartment 18; a similar sheet or apron 21 is secured between the cross pieces or partitions 8 and 9 to form a bottom for the compartment 18′ and a similar sheet or apron 22 is secured between the cross pieces 9 and 10 to provide a bottom for the compartment 19. The aprons 20, 21 and 22 slope from one side of the frame 1 to the other side in the manner of chutes, to deliver the fruit to the last mentioned side, as will hereinafter appear. The shell is mounted for rotation in a peculiar manner, the forward or receiving end of the shell being provided with an exterior flange 23 which is flush with the said end, and a pair of grooved bearing rollers 24, being carried by the cross piece or partition 7 and receiving the said flange. The flange 23 resting in the grooves of the bearing rollers 24 will permit the shell to rotate freely, and will constrain the shell from shifting longitudinally, while at the same time, the forward or receiving end of the shell is open or unobstructed.

In order to support the rear portion of the shell for rotation and in order to rotate the shell, a longitudinal shaft 25 is disposed axially within the shell section 14 and its rear end projects from the rear shell section and is journaled to the cross piece 11 of the frame. A rear spider including a hub 26 is secured upon the shaft 25 within the rear end of the section 14 and is provided with the spokes 27 attached at their outer ends to the rear end of the section 14. A similar forward spider including a hub 28 is secured upon the forward end of the shaft 25 within the forward end of the section 14, the hub 28 being provided with the spokes 29 secured at their outer ends to the forward end of the section 14. In this manner, the forward portion of the shaft 25 is secured axially within the rear section of the shell, and the two sections of the shell being coupled together, will permit the shell as a whole to rotate freely. The shaft 25 has a sprocket wheel 30 keyed upon its rear end, in order that the shaft 25 may be rotated mechanically or manually. The means for rotating the shaft is of no particular moment, and need not be illustrated nor described, it being understood that various means may be provided for this purpose.

The hub 26 and its spokes 27, and the hub 28 and its spokes 29, form spiders secured within the shell section 14 near the rear ends of the respective sections, it being noted that the shaft is secured through the hubs of the spiders, that the forward end of the shaft terminates short of the receiving end of the shell, and that its rear end projects from the delivery end of the shell and is journaled to the frame, whereby the shell will be effectively supported for rotation in connection with the flange 23 and bearings 24.

A suitable table 31 is supported by the frame 1 in advance of the shell, or adjoining the receiving end of the shell 11 above the bottom of the same, the table 31 being provided with a rear depression 32 coöperating with the lower portion of the receiving end of the shell and the flange 23.

In use, supposing the shaft 25 is rotated at the proper velocity to rotate the shell, the fruit to be graded is dumped onto the table 31 and from thence runs into the receiving end of the shell, the depression 32 facilitating this operation.

The flange 23 serves to direct the fruit from the depression 32 into the shell section 13. It is to be observed that the bottom of the shell slopes rearwardly, in order that the fruit will tend to roll rearwardly through the shell. The rearward movement of the fruit is somewhat retarded due to the rotation of the shell, which agitates the fruit laterally. The smallest fruit will pass through the openings of the forward section 13 of the shell into the compartment 18, while the next grade or size of fruit will pass through the openings or apertures of the succeeding section 14 into the compartment 18′.

The largest fruit will be delivered from the rear end of the shell into the compartment 19 as will be evident. The fruit in dropping onto the aprons will be prevented from being bruised, and will immediately be discharged at the respective side of the frame, into baskets or suitable receptacles stationed or suspended at the said side of the frame. The fruit, or other commodities to be graded, may be readily run or dumped into the forward or receiving end of the shell, the various grades of fruit precipitating through the respective openings or apertures of the shell, to the respective compartments, or being discharged at the delivery end of the shell to the rear compartment. The fruit may thus be graded in a facile and expeditious manner, it being possible to run a steady quantity of fruit into the shell by means of the table 31, or by any other suitable means.

Attention is directed to the fact that the receiving end of the shell is completely open and unobstructed and that the shaft 25 terminates short of the front end of the section 13 to permit an uninterrupted passage of fruit into the section 13. The spokes or spider arms 29 somewhat serve to divide the two sections of the shell, in order to have a tendency to retain the fruit within the shell 13 for a sufficient period, in order to insure of the gravitation of all of the small fruit through the forward shell. Similarly, the spokes 27 at the rear end of the shell, tend to retain the fruit within the rear section of

the shell, in order to insure of the next grade or size of fruit being delivered through the openings of the rear shell, before the largest size or grade of fruit is discharged into the rear compartment or shell. Particular attention is also directed to the fact that the openings of the shell are provided with the outstanding rims or flanges, whereby injury to the fruit is prevented or eliminated.

From the foregoing taken in connection with the drawing, the other advantages and capabilities of the present invention will be apparent to those versed in the art, it being observed that the objects aimed at have been carried out satisfactorily.

Having thus described the invention, what is claimed as new is:—

In a grader, a frame, a shell comprising forward and rear sections having relatively small and large perforations, respectively, and having their adjacent ends telescoped together, bearings carried by the frame, the forward section having an exterior flange flush with the front end thereof and seated in the said bearings, a table carried by the frame in advance of the shell and having a rear depression coöperating with the lower portion of the front end of the forward section and said flange, the flange serving to direct articles from the said depression into the forward section, a shaft disposed axially within the rear section, and spiders secured upon the shaft and to the front and rear ends of the rear section, the forward spider tending to retain the articles in the forward section, and the rear spider tending to retain the articles in the rear section, the rear end of the shaft projecting from the rear section and being journaled to the frame, and the forward end of the shaft terminating short of the front end of the forward section to permit an uninterrupted passage of articles into the forward section.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN H. O. KEMP.

Witnesses:

CHAS. H. LEWIS,

R. C. COWLING,