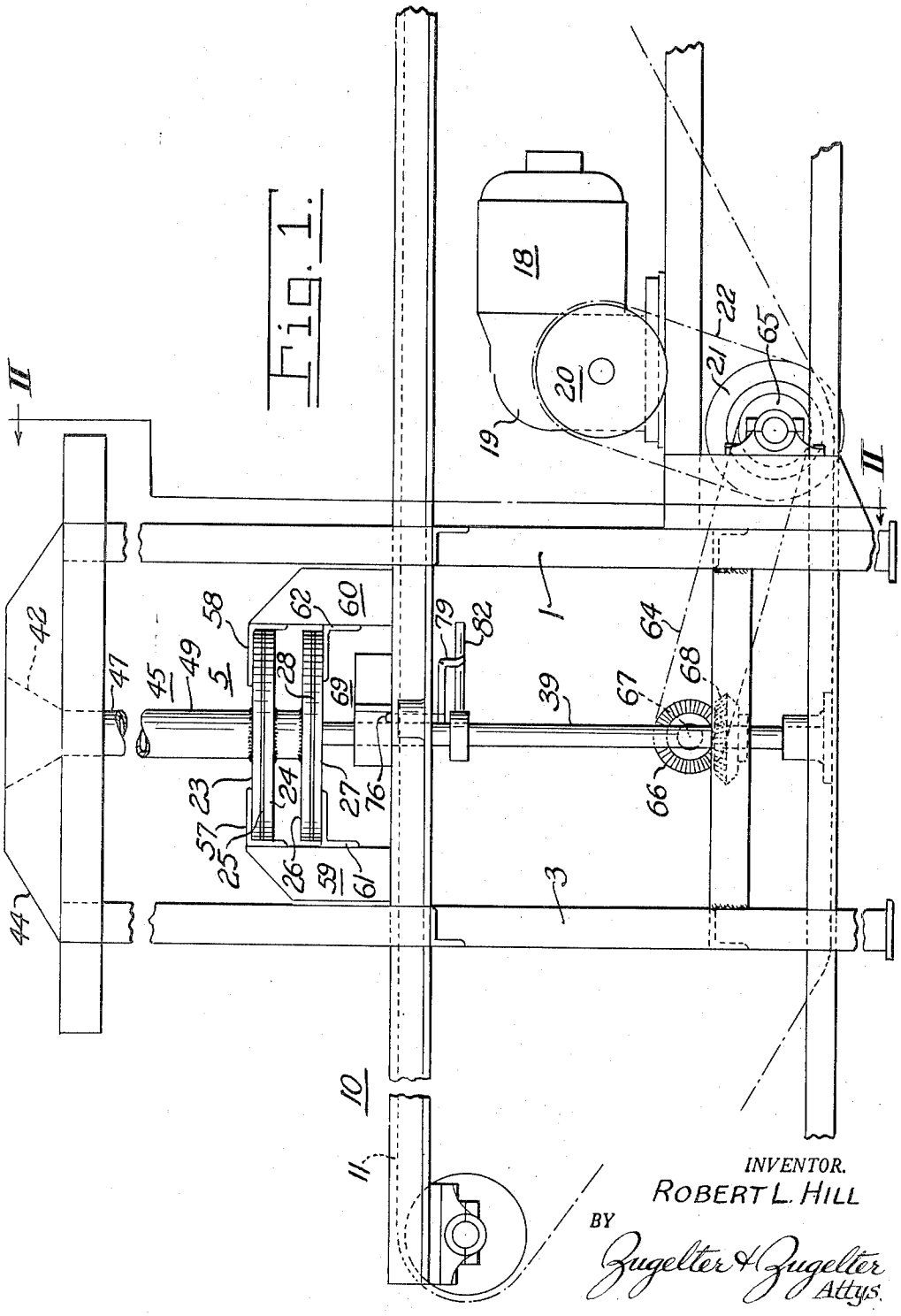
Sept. 18, 1956 R. L. HILL 2,763,418

MACHINES FOR FILLING CANS WITH SPAGHETTI AND THE LIKE

Filed May 31, 1955 4 Sheets-Sheet 1

Fig. 1.



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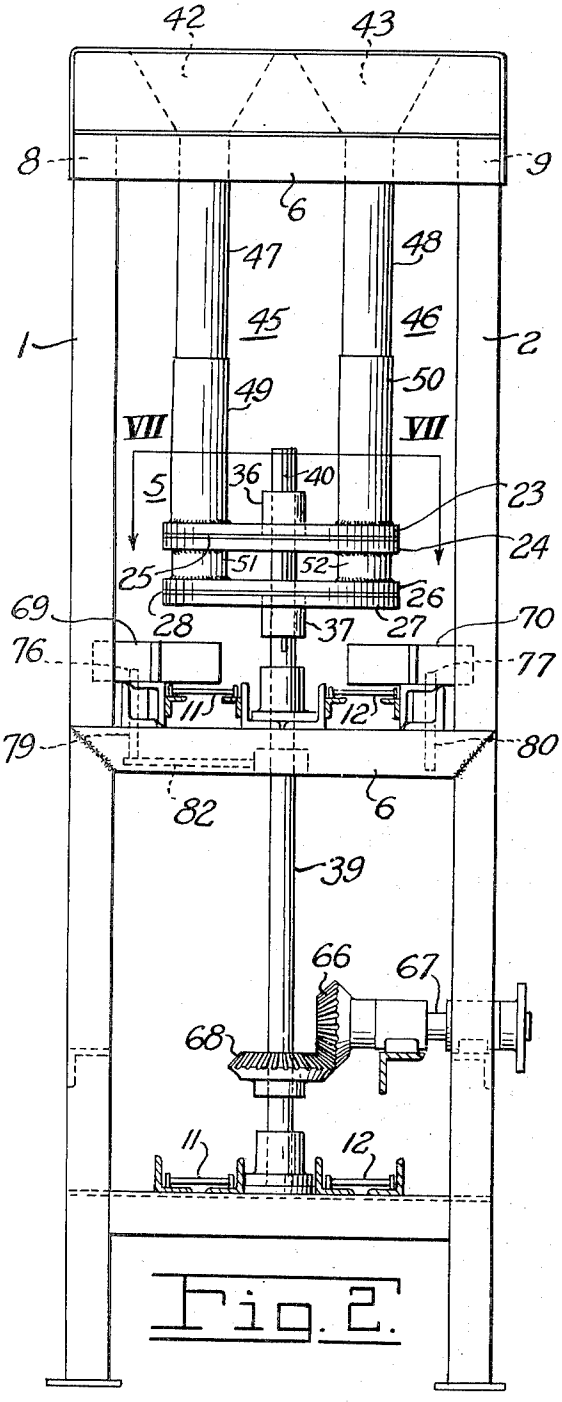


Fig. 2.

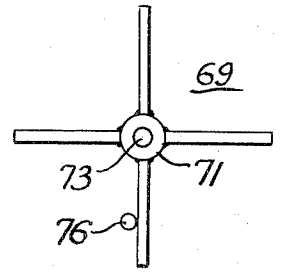


Fig. 3.

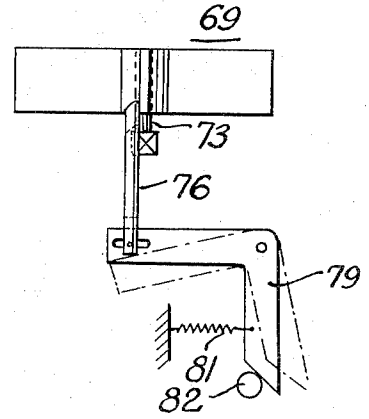


Fig. 4.

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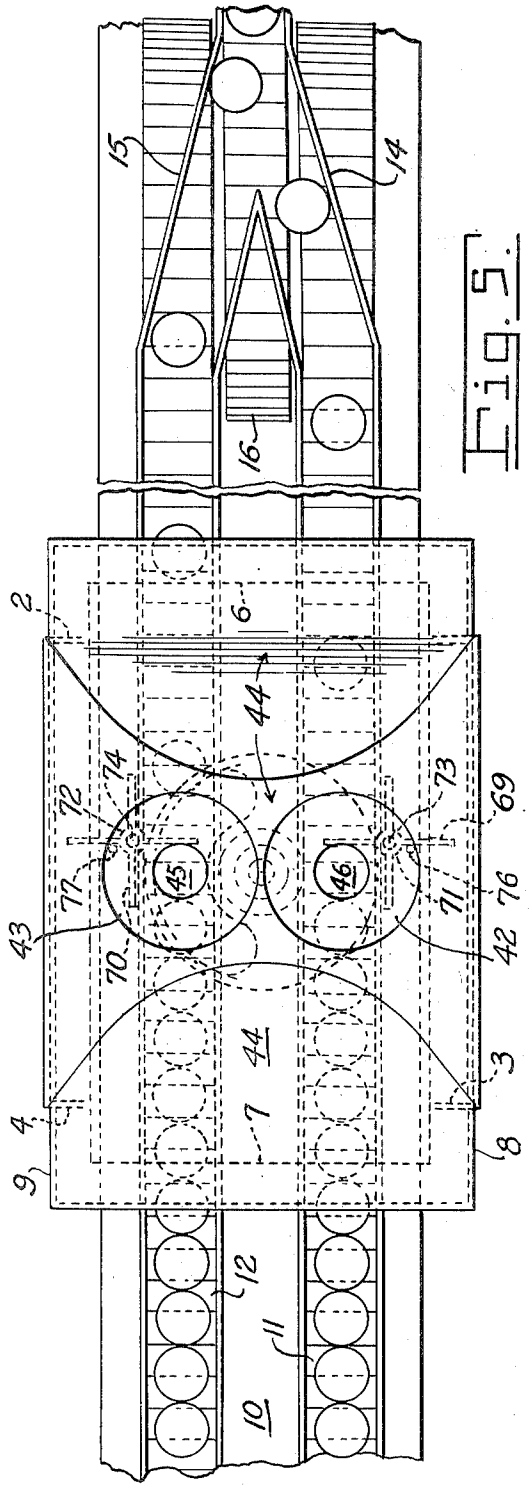


Fig. 5.

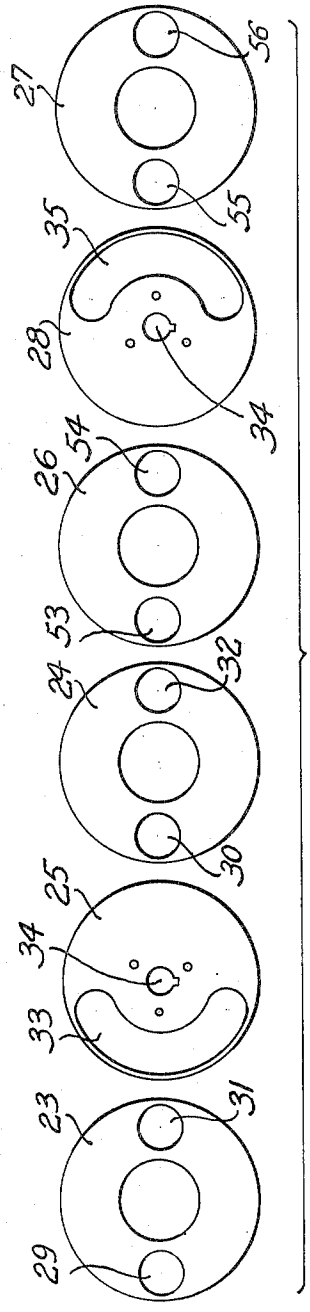


Fig. 6.

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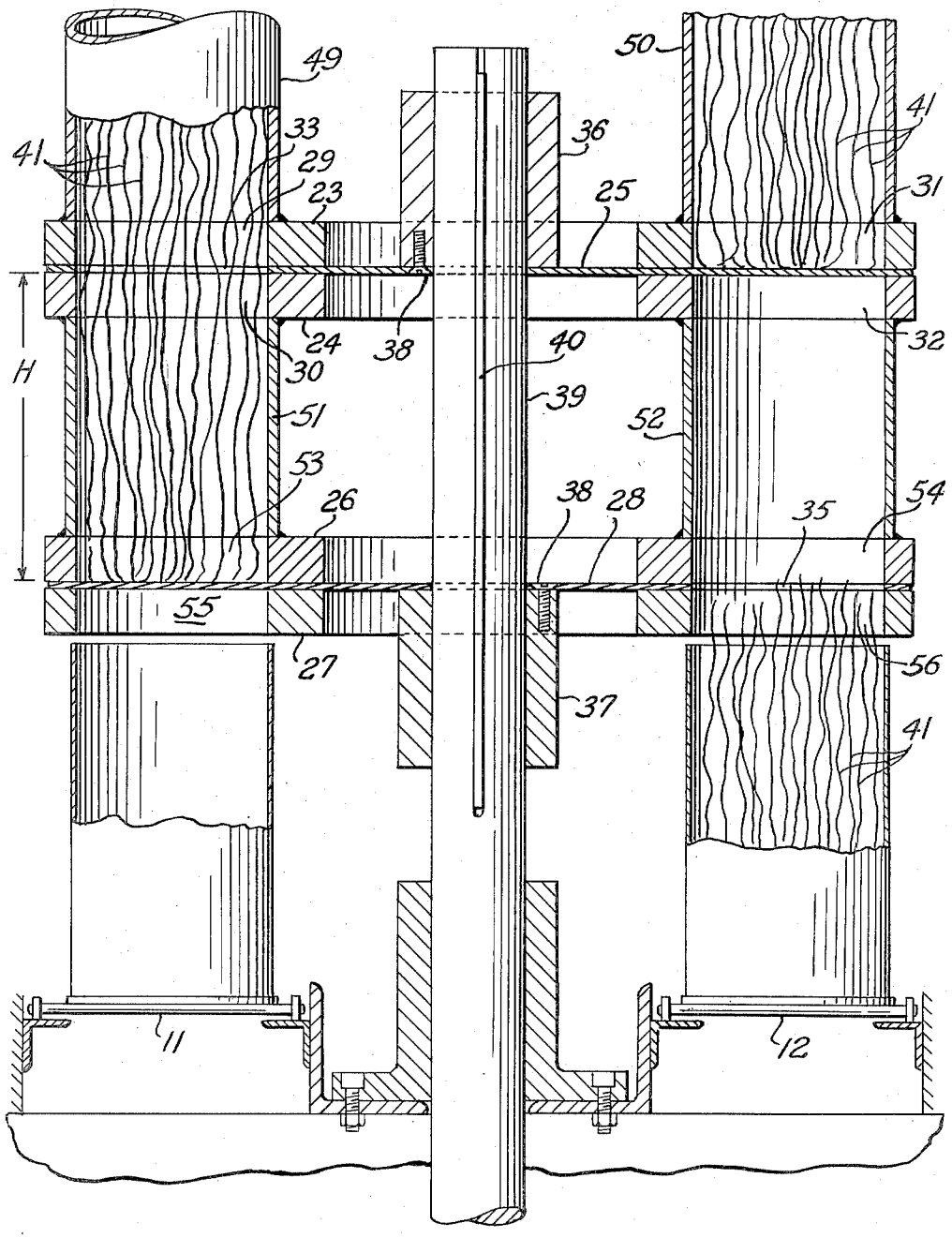


Fig. 7.

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United States Patent Office 2,763,418 Patented Sept. 18, 1956

2,763,418

MACHINES FOR FILLING CANS WITH SPAGHETTI AND THE LIKE

Robert L. Hill, Austin, Ind., assignor to Morgan Packing Company, Inc., Austin, Ind., a corporation of Indiana

Application May 31, 1955, Serial No. 511,905

4 Claims. (Cl. 226—95)

This invention relates to automatic can-filling machines and more particularly to machines adapted to automatically deposit measured quantities of a stringy material, such as spaghetti, into a can or other receptacle.

Heretofore, unsuccessful attempts have been made to build machines for automatically filling cans with a stringy material, such as spaghetti. To be successful, such machines should supply the spaghetti in a substantially uncomminuted form to the cans. In other words, the stringy material deposited in the cans should be as long as the can size permits. Machines as heretofore attempted were unsuccessful for several reasons, among which was the inability of the machines to control the length of the pieces delivered to the cans.

An object of this invention is to provide a machine whereby a measured charge of cooked or partially cooked material, such as spaghetti or the like, may be fed in its stringy condition to a unit in which a measured quantity of the material is cut off and discharged into a can or other receptacle which is moving under the unit in timed relation to the charge and discharge of such measured quantity to and from the unit.

Another object is to provide a machine having a plurality of hoppers into which the material in its stringy unbroken condition may be fed, a guide tube for each hopper of substantially the same diameter as the cans or receptacles to be fed, and a measuring and cut-off means for each tube so arranged that as a measured quantity from one tube is cut off and discharged into a can, material from another tube still in its unsevered condition is being measured, and cut off to be discharged after the preceding operation has been completed, the measuring and cut-off operations being in timed relation with the positioning of cans under the measuring, cut-off and discharge means.

The above and other objects of the invention will be apparent to those of ordinary skill in the art to which the invention pertains from the following description taken in conjunction with the accompanying drawings.

In the drawings:

Figure 1 is a view in side elevation of a machine embodying a form of the invention;

Fig. 2 is an end view of the machine partially in section as taken on line II—II of Fig. 1;

Fig. 3 is a top-plan view of a star wheel employed in the feeding of cans to the measuring cut-off and discharge means of the machine;

Fig. 4 is a view in side elevation of the star wheel of Fig. 3 showing a trip mechanism for controlling step-by-step rotation of the star wheel;

Fig. 5 is a top-plan view of the machine shown in Figs. 1 and 2;

Fig. 6 is an exploded view of the component parts of the measuring discharge and cut-off units embodied in the machine; and

Fig. 7 is an enlarged view in section taken on line VII—VII of Fig. 2.

The machine as illustrated in Figs. 1, 2, and 5 comprises a frame having spaced columns 1, 2 and 3 and 4 disposed at the entering and discharge end of an automatic measuring cut-off and discharge means or unit 5. The upper end of the columns 1, 2 and 3, 4 are tied together by end members 6 and 7 and side members 8 and 9. The frame of the machine above described, supports a conveyer mechanism 10 by means of which containers such as cans or other suitable containers are moved under the means 5.

As shown more particularly in Figs. 2 and 5 the conveyer mechanism 10 comprises two separate conveyers 11 and 12 which are driven at the same speed. The conveyers 11 and 12 are parallel to each other and provide two supply lines of cans to the means or unit 5. When the cans have been filled by the unit 5, they proceed until they engage deflectors 14 and 15. The deflectors 14 and 15 deflect the cans onto a single conveyer 16 by means of which the cans are taken to stations where other substances are added to the cans, for example in the case of spaghetti, spaghetti sauces and the like. The conveyer 16, which is only partially shown, can be driven by any suitable drive mechanism not shown. The conveyer mechanism 10 is driven by a motor 18 through a gear reduction mechanism 19, pulleys or sprockets 20 and 21 and a belt or chain 22. The conveyers 11 and 12 are driven by pulley 21, as shown.

The unit 5 which is provided for automatically measuring, cutting off and discharging a measured quantity of stringy material, such as spaghetti, into cans delivered under the device by the conveyers 11 and 12, is illustrated more in detail in the enlarged view of Fig. 7. As there illustrated, unit 5 comprises a first pair of plates 23 and 24 which are slightly spaced so as to receive between them a rotatable member 25, and a second pair of stationary plates 26 and 27 which are slightly spaced to receive a rotatable member 28 between them. The plates of the first and second pairs as shown are stationary. The first pair of plates 23 and 24 are provided with aligned pairs of apertures 29 and 30 and 31 and 32. The pairs of apertures 29–30 and 31–32 are spaced from each other substantially 180° apart as shown. The rotatable member 25 as shown in Fig. 6 is provided with a cut-off aperture 33. The cut-off aperture 33 may be relatively long but concentric with the center or axis of rotation 34. The aperture 33 as illustrated extends for approximately 180°. The remainder of the member 25 is solid. The member 28 as shown in Fig. 6 is provided with an aperture 35 that is approximately 180° from the aperture 33, that is, it is directly opposite the aperture 33.

The rotatable members 25 and 28 are secured to hubs 36 and 37 by means of screws 38 or other suitable means. The hubs are secured fast to a vertical drive shaft 39 by means of a key 40.

As shown in Figs. 2, 5 and 7 more particularly and to a limited extent in Fig. 1, the stringy material 41 to be fed to the device 5 is supplied thereto by means of hoppers 42 and 43 of substantially funnel shape. The hoppers are supported by an apron 44 which is so arranged as to protect the mechanism below from particles of stringy material that escapes the operator.

The funnels 42 and 43 are connected by tubes 45 and 46 to the apertures 29 and 31 in plate 23. Tubes 45 and 46 comprise respectively upper tubular sections 47 and 48 and lower tubular sections 49 and 50. The lower ends of the sections 47 and 48 are telescopically received in the sections 49 and 50. The lower ends of tubular sections 49 and 50 are secured to the plate 23 by welding or otherwise so that the apertures 29 and 31 are in registry with the passageways in tubes 49 and 50.

The apertures 30 and 32 in plate 24 are connected by relatively short tubular sections 51 and 52 to apertures 53 and 54 in plate 26. The diameters, that is the in-

ternal diameters, of sections 51 and 52 and the height H between the rotatably mounted members 25 and 28 are such that the volume is slightly less than the volume of a can to be filled with the food product. This will leave space in the cans for sauces and other food materials that are added to the spaghetti at some station supplied by the conveyer 16. Plate 27 is provided with apertures 55 and 56 that register with the tubular sections 51 and 52.

As can be seen in Fig. 7, the cans are brought to rest under the unit or device in alignment with openings 55 and 56 for the purpose of filling. The mechanism for feeding the cans step-by-step is designed to bring the cans to rest while receiving a charge and then releasing them so that the conveyers move them along out of the path of the material discharged alternately through apertures 55 and 56 into cans which have been placed in position to be filled.

As shown in Fig. 1 the upper plate 23 is secured to angle members 57 and 58 carried by support members 59 and 60 of the frame of the machine. The plate member 27 rests on angle members 61 and 62 carried by the support members 59 and 60 also. Thus it will be seen that the plate members 23 and 24 comprising the first pair of plates and the plate members 26 and 27 comprising the second pair of plates are secured in a fixed relationship to each other so that the volume of stringy material, which is measured, cut off and fed to cans, will be uniform and substantially constant.

The rotatable members 25 and 28, as stated supra, are driven by shaft 39. Shaft 39 may be driven by motor 18 through a belt or chain 64 running off a pulley or sprocket 65 on the shaft driven by belt 22. The driving element 64 drives a bevel gear 66 mounted on a shaft 67. The gear 66 meshes with a bevel gear 68 keyed to the shaft 39. Associated with the conveyers are star wheels 69 and 70 such as shown in Fig. 3. Each of these wheels is provided with four arms disposed at right angles to each other and are rotatably mounted on hubs 71 and 72 through which vertical shafts 73 and 74 extend. The star wheel 69 associated with conveyer 11 is driven clockwise whereas the star wheel 70 associated with conveyer 12 is driven counterclockwise.

The star wheels 69 and 70 are driven with intermittent motion. In order to produce this intermittent motion, vertically movable stops 76 and 77 are provided for the respective star wheels. The stops as shown in Fig. 4 are connected at their lower ends to bellcranks 79 and 80 which are pivoted at the knees thereof on pivot pins. The bellcranks are urged in a direction to hold the stops in position to engage the arms of the star wheels by means of springs 81. The bellcranks are rotated in a direction to pull the stops downwardly and out of engagement with the arms of the respective star wheels by means of a horizontally projecting arm 82 that is fastened to the shaft 39.

When a can is conveyed forwardly on conveyer 11 until it strikes an arm of the star wheel 69, it is brought to rest directly under the discharge opening 55 in plate 27. Similarly, when a can is brought against an arm of the star wheel 70, the can comes to rest directly under the discharge opening 56 in plate 27. The cans thus brought to rest are alternately filled, following which one can moves on and then the other.

As can be seen from inspection of Figure 6, the discharge opening 55 is closed when the discharge opening 56 is uncovered and the discharge openings 29 and 30 are in communication with the tube 51 when the discharge opening 54 is closed. Also as can be seen in Fig. 7, the discharge opening 29 is closed by rotatable member 25 when the discharge opening 55 is uncovered. Thus the measuring tube 51 is being filled while the measuring tube 52 is being discharged.

The operation of the device is as follows. Assuming that there are one or more operators supplying spaghetti or similar stringy material which is either partially or fully cooked, into the funnels of the machine, the operators take care that the tubes 45 and 46 are adequately filled. By filled is meant that the density of the material in cross section within the tubes 45 and 46 is that required to provide a given weight of material in a can. The stringy material is then supplied to the tubes continuously so that the automatic device 5 can function properly. As shown in Fig. 7, the material drops into the tube 51 when the rotatable member 25 is in the position shown. In that position the opening 33 in member 25 registers with the aperture 30 in plate 24. At the same time the solid part of member 25 closes the opening 32 leading to tube 52. Now as the shaft 39 rotates, the material in tube 51 will be severed by the trailing edge of the opening 33 in plate member 25. When that severing occurs, the circular opening in member 27 will be in registry with the discharge opening 55 so that the measured and severed quantity of the material in tube 51 will discharge by gravity into the can directly under it.

As soon as the material has dropped into the can under opening 55, the trip arm 82 on shaft 39 strikes the bellcrank 79 associated with conveyer 11 causing the stop 76 to be pulled downwardly to allow the star wheel to turn one step so that another can will come into position to be filled. The moment that the material has been discharged into the can under opening 55, the solid part of rotatable member 28 will be in position to close the opening or aperture 55. But at the same time the opening 33 in member 25 will have moved to the position where the material in tube 50 falls by gravity into the tube 52. At this point it should be mentioned that the arcuate length of the opening 33 is sufficient to allow the time required for the material to drop from either tube 49 or tube 50 into the respective measuring tubes 51 and 52. When the material drops into tube 52, the discharge opening 56 is closed until the opening 35 again registers with opening 56.

Thus it will be seen that the measuring tubes 51 and 52 are alternately charged with materials from the hoppers and alternately discharged to the cans.

When the material has been discharged into the can which is being held under the opening 56, the trip arm 82 engages the bellcrank associated with the conveyer 12 whereby the stop 77 is retracted sufficiently to allow the wheel to turn one step whereby an unfilled can is placed under the opening 56.

The cans, as stated, having been filled pass on to other stations in the production line where condiments, tomato paste or other food material is added to the cans. As these aspects or functions which take place beyond the device 5 do not enter into the invention, it is not necessary to mention them further.

Having thus described the invention, it will be apparent to those of ordinary skill in the art to which the invention pertains, that various modifications and changes may be made in the illustrated embodiments without departing from either the spirit or the scope of the invention. Therefore, what is claimed as new and desired to be secured by Letters Patent is:

1. A machine for automatically measuring a predetermined quantity of a stringy food product, such as spaghetti, cutting off said measured quantity, and depositing said quantity in a can, comprising a hopper into which the stringy food product is delivered, a tube connected at its upper end to said hopper and into which the product passes by gravity, a measuring, cutoff and discharge unit connected to the lower end of said tube, said unit comprising a first pair of spaced stationary upper plates, a member rotatably mounted between said plates, said plates having apertures aligned with the lower end of said tube, said rotatable member having an aperture defining a cutting edge, whereby when the aperture is aligned with the plate apertures, the stringy material

passes through them and when the rotatable member is rotated to a position where the aperture therein is out of registry with the plate apertures, the material is cut off, a second pair of spaced stationary plates having aligned apertures aligned with the apertures in the plates of the first pair, said second pair being below the upper pair a predetermined distance, a member rotatably mounted between the plates of the second pair and provided with an aperture defining a cutting edge, a tube connecting the apertures of the lower plate of the upper pair and the aperture in the upper plate of the lower pair, said rotatable members being provided with means for rotating them in unison, the aperture in the lower plate being so located that it registers with the apertures in the plates of the lower pair when the cutting aperture in the rotatable member of the upper pair is in cut-off position, and means for moving cans with intermittent motion under said second pair of plates to receive the cut-off measured quantity of material when discharged through the apertures in the rotatable member of the second pair and the stationary plates of the same.

2. A machine as in claim 1 in which the volume of the tube connecting the apertures of the first and second pairs

of plates is a predetermined amount less than the volume of a can to be filled.

3. A machine as in claim 1 in which the stationary plates of the first and second pairs are provided with pairs of aligned pairs of apertures the centers of which pairs are spaced approximately 180° apart, the rotatable members of the first and second pairs are provided with elongated apertures which are concentric with their respective axes of rotation, the elongated openings being approximately 180° apart, a hopper and guide tube are provided for supplying each pair of apertures in the upper plate of the first pair of plates, a tube connects each pair of aligned apertures in the lower and upper plates of the first and second pairs respectively, whereby material is supplied alternately to said measuring tubes and alternately cut off and discharged to cans under the same as the rotatable members are rotated in unison.

4. A device as in claim 1 in which the internal diameter of the tube connecting the hopper with the aperture in the upper plate of the first pair of plates is substantially the same diameter as the aperture in said upper plate.

No references cited.