Sept. 7, 1926. 1,598,725

W. M. INGRAM

BAGGING MACHINE

Filed June 1, 1925 6 Sheets-Sheet 1

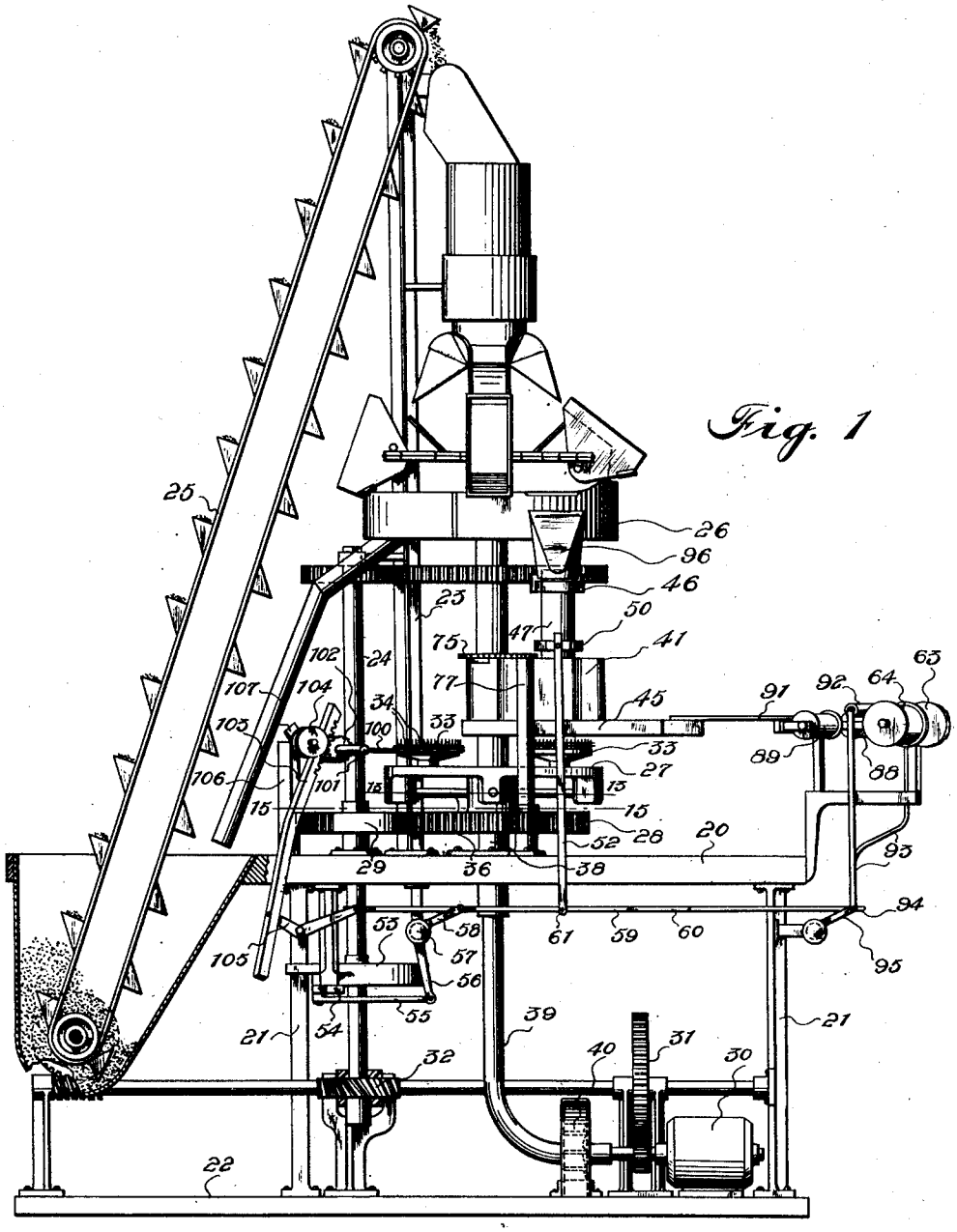


Fig. 1

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Sept. 7, 1926. 1,598,725

W. M. INGRAM

BAGGING MACHINE

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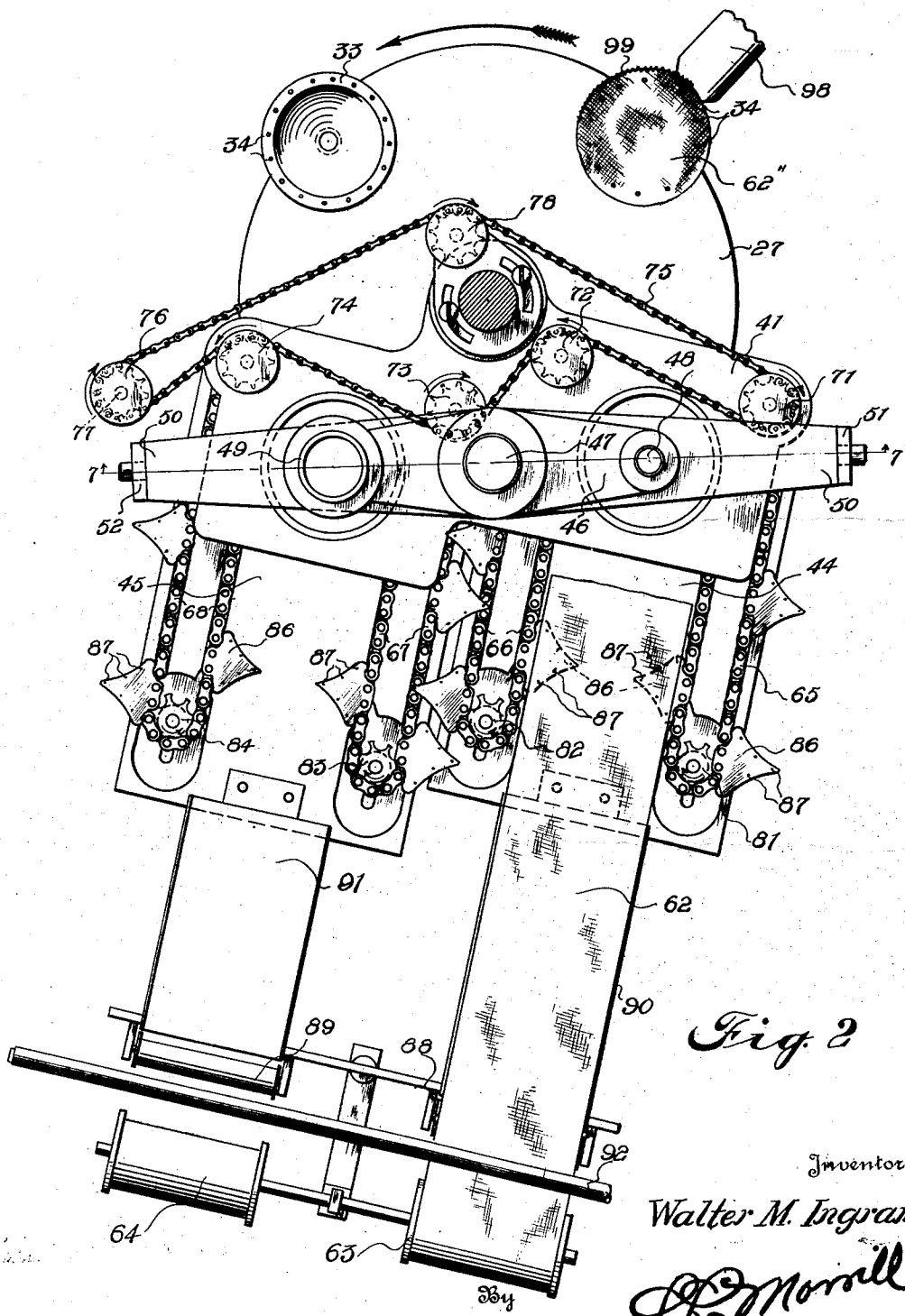


Fig 2

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W. M. INGRAM

BAGGING MACHINE

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Fig. 3

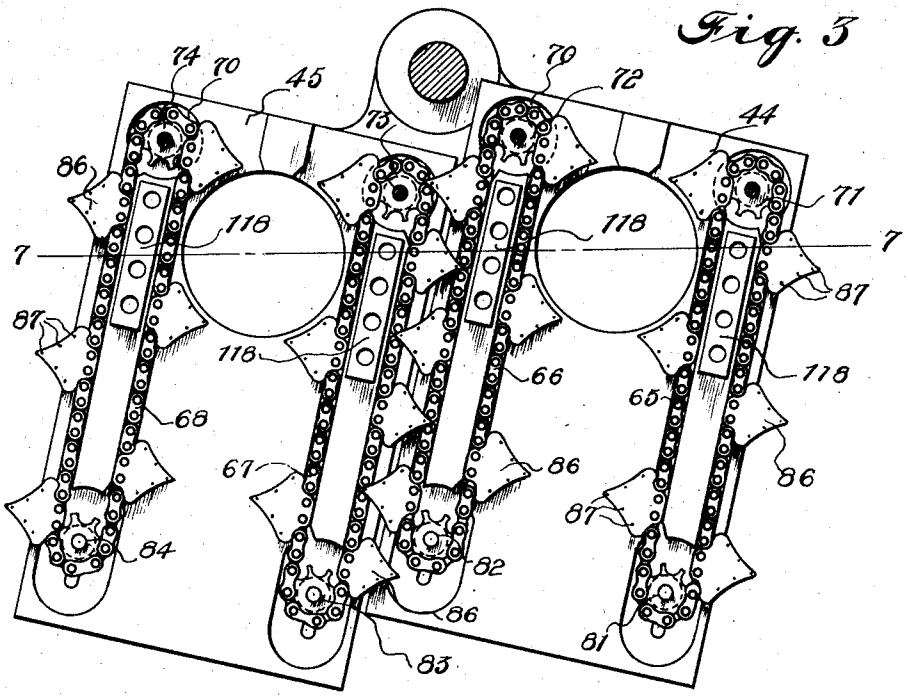


Fig. 4

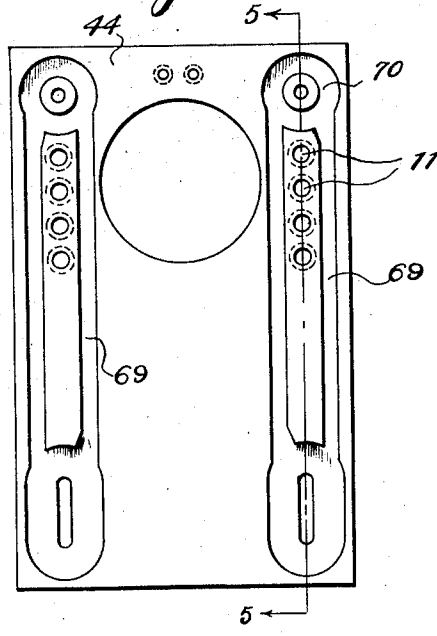
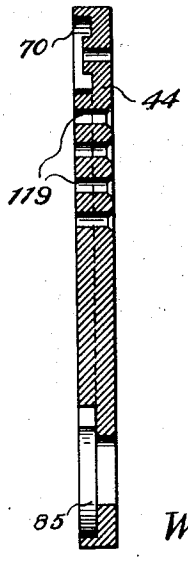


Fig. 5



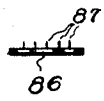


Fig. 6

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BAGGING MACHINE

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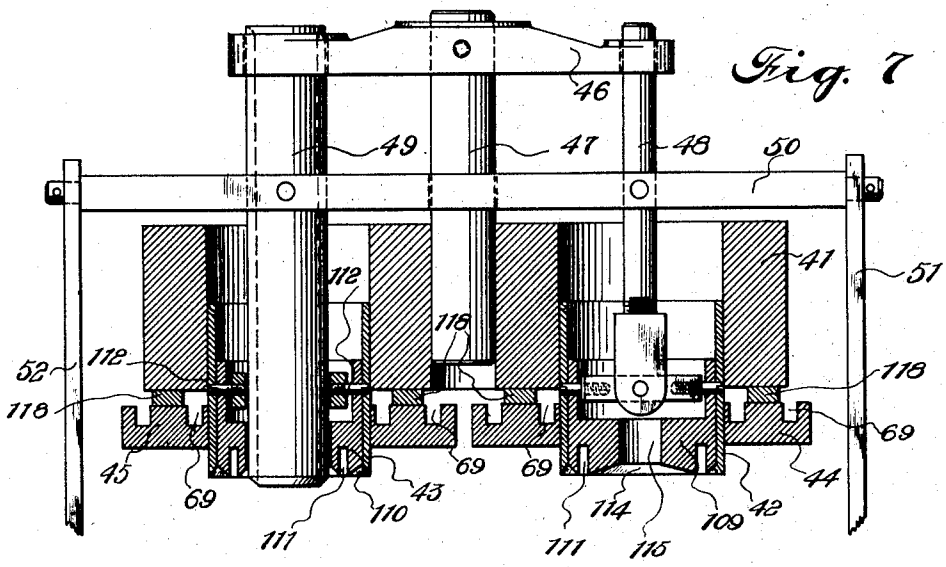


Fig. 7

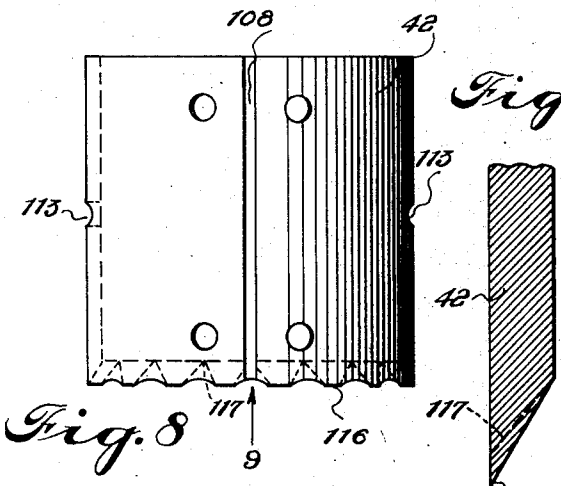


Fig. 8

Fig. 11

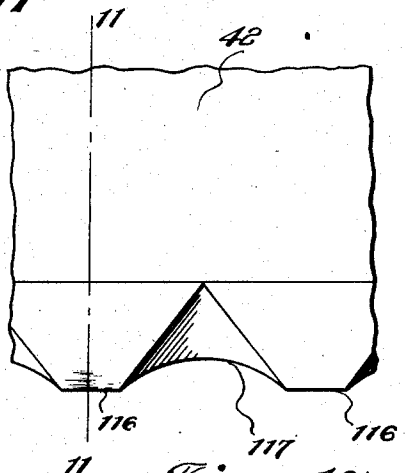


Fig. 10

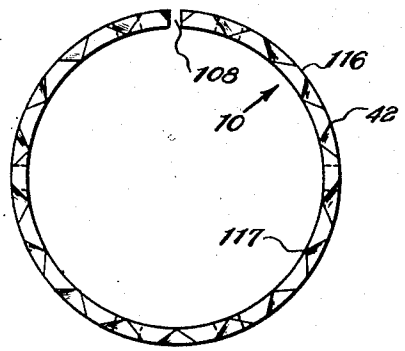


Fig. 9

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W. M. INGRAM

BAGGING MACHINE

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Fig. 12

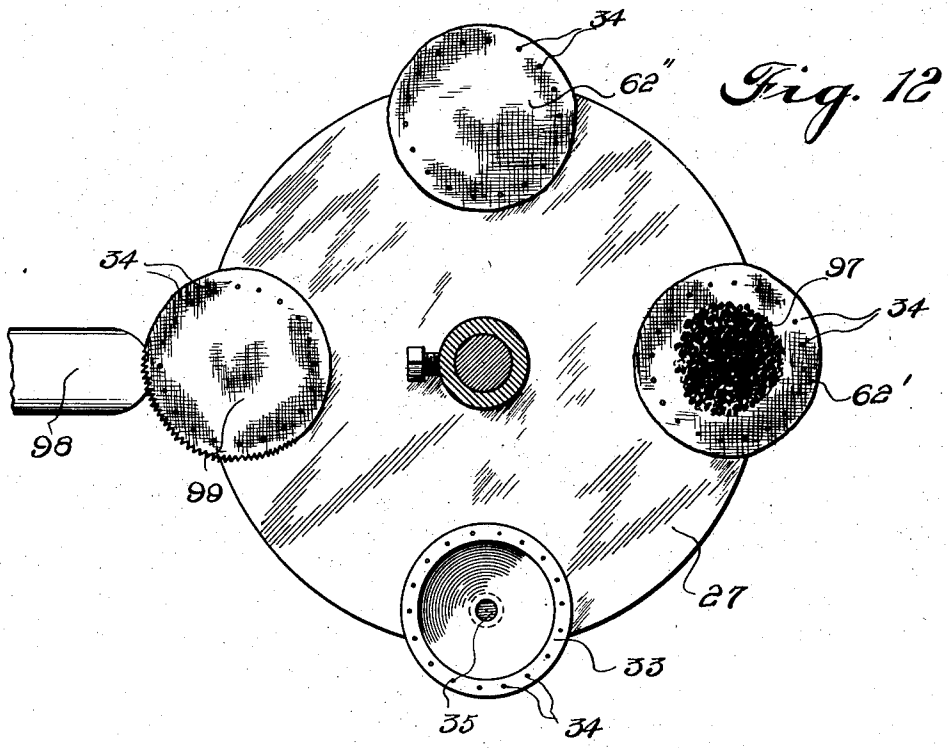
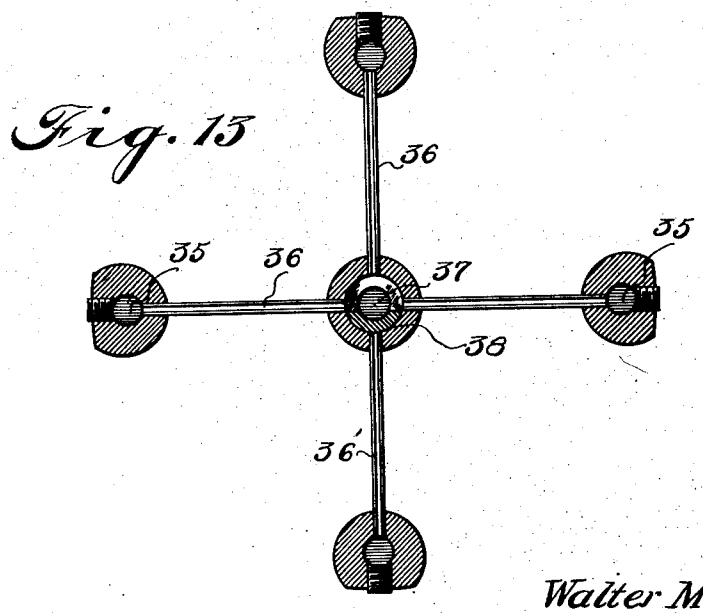


Fig. 13



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Sept. 7, 1926. 1,598,725

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BAGGING MACHINE

Filed June 1, 1925 6 Sheets-Sheet 6

Fig. 15

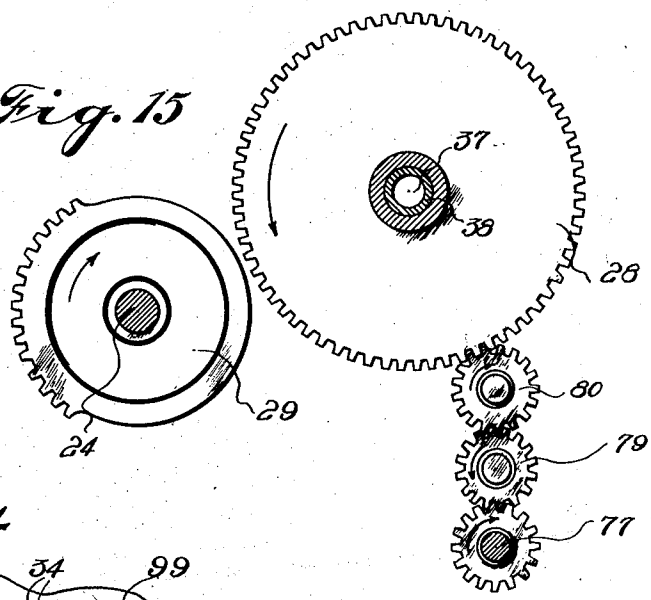


Fig. 14

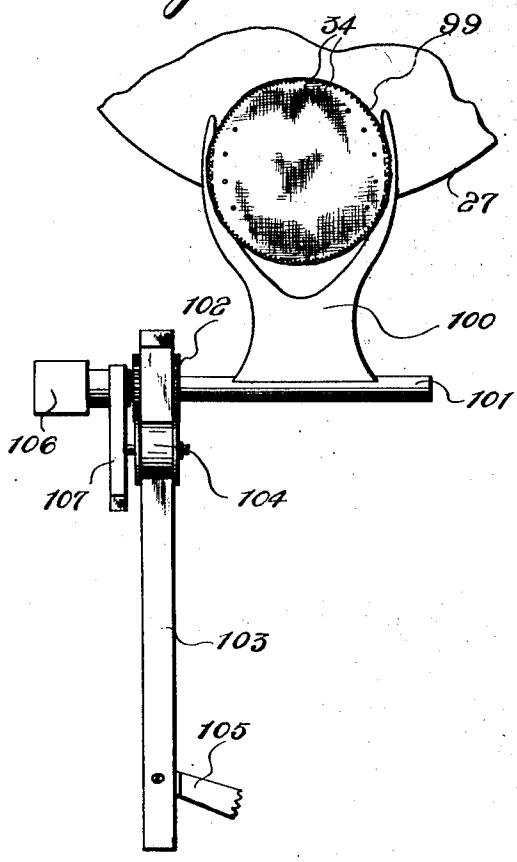
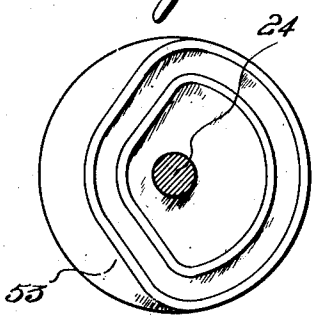


Fig. 16



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Patented Sept. 7, 1926 1,598,725

UNITED STATES PATENT OFFICE.

WALTER M. INGRAM, OF SUDBROOK PARK, MARYLAND, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE SANITARY TEA BAGGING COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

BAGGING MACHINE.

Application filed June 1, 1925. Serial No. 34,092.

This invention relates to bagging machines and has for an object to provide a bagging machine resembling in general construction and operation the bagging machine disclosed in application Sr. No. 738,637, filed September 19, 1924, and the present invention is directed more particularly to improvements upon that type of machine.

A further object of the invention is to provide improved type of cutting dies and cutting die-actuating mechanisms.

A further object of the invention is to provide improved type of fabric feeding device.

A further object of the invention is to provide an improved kick-off for releasing the completed and closed bag from the machine.

A further object of the invention is to provide improved mechanical means for operating the several instrumentalities in proper timed relation.

With these and other objects in view, the invention comprises certain novel parts, elements, units, combinations, constructions, interactions and functions as disclosed in the drawings together with mechanical and functional equivalents thereof as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a view of the improved machine in side elevation.

Figure 2 is a top plan view of the cutting dies and fabric feeding mechanism.

Figure 3 is a top plan view of the fabric feeding mechanism disassociated from associated parts.

Figure 4 is a top plan view of one of the plates for carrying one of the fabric feeding units.

Figure 5 is a sectional view through the plate taken on line 5—5 of Figure 4.

Figure 6 is a view in edge elevation of one of the fabric carriers.

Figure 7 is a vertical sectional view through the dies, die block and fabric feeding mechanism taken on line 7—7 of Figure 2, the plane being also indicated by line 7—7 of Figure 3.

Figure 8 is a view in side elevation of one of the cutting dies.

Figure 9 is an inverted plan view of one one of the dies as indicated by arrow 9 at Figure 8.

Figure 10 is a greatly enlarged detail view showing the cutting die seen from the inside as indicated by arrow 10 at Figure 9.

Figure 11 is a sectional view through the cutting die taken on the scale and indicated by the section line 11—11 of Figure 10.

Figure 12 is a top plan view of the turn table showing the position and relation of the bags thereon and thereto, the central shaft and hub being shown in section.

Figure 13 is a horizontal sectional view taken on line 13—13 of Figure 1.

Figure 14 is a top plan view of the kick-off associated with a completed bag in position to be released from the supporting cup.

Figure 15 is a top plan view through the gearing as indicated by the line 15—15 of Figure 1.

Figure 16 is an inverted plan view of the cam employed for producing reciprocating and oscillating movements of some of the parts.

Like characters of reference indicate corresponding parts throughout the several views.

As in the said co-pending application 738,637, the present device is mounted upon a deck or platform 20 supported in any approved manner as by the uprights 21 from the floor or base 22.

Also erected upon this deck 20 is an upright 23 providing for bearings for the vertical shaft 24 and the elevator 25. These parts are similar in general effect and make-up to the disclosure of said co-pending application and no especial description will be introduced into the present case. Also, as in that case, a weighing and dumping device indicated as an entirety at 26 is employed in conjunction with the bagging machine but performs no function other than delivering the commodity in proper charges to the bagging machine.

The bagging machine comprises a turn table 27 which is rigidly connected or integral with a gear 28 which in turn is driven by the mutilated gear 29. This mutilated gear 29 is carried upon the shaft 24 driven in any approved manner as from the motor 30 through the medium of the gears 31 and 32.

It will be noted that as shown in the drawings the mutilated gear 29 is provided with teeth about a third of its periphery,

the teeth equaling in number a fourth of the teeth upon the gear 28, so that the gear 28 is rotated a fourth of a revolution at each revolution of the shaft 24 and gear 29.

The turn table 27 is provided with a plurality of cups 33 similar to the corresponding cups in said co-pending application and similarly provided about their peripheries with upstanding penetrating points 34. These several cups 33 are dished and provided with central openings 35 which communicate through tubular spokes 36 with the conduit 37 in the hollow shaft 38 which is within the hub of the turn table 27, such hollow shaft communicating through the conduit 39 with an exhaust mechanism indicated conventionally at 40. So that, all of the cups 33 are under the action of exhaust except during such time as one of said cups is opposite the unorificed part of the hollow shaft, as indicated by the hollow spoke 36' in Figure 13, at which time the exhaust is interrupted and at which time it is the intent that the kick-off mechanism to be hereinafter more fully described shall operate.

The construction of the turn table and the cups are also similar to the construction in said co-pending application. Located above the turn table is a guide block 41 and mounted to reciprocate vertically in openings in said block are dies 42 and 43. Immediately below the guide block 41 are die blocks 44 and 45 having openings registering with the openings in the guide block 41 and so positioned that the dies 42 and 43 in moving downwardly, guided by the guide block 41, will pass in shearing relation through the openings of said die blocks 44 and 45.

To actuate the dies 42 and 43 a crosshead 46 is mounted upon a rod 47 mounted to slide in the guide block 41 as also a guide for the crosshead 46. Extending downwardly from the crosshead 46 is a rod 48 connected in any approved manner as pivotally to a cutting die 42 and a hollow rod 49 extending downwardly and connecting with the cutting die 43.

Extending also across from the hollow rod 49 and the rod 48 is a bar 50 to the ends of which are attached links 51 and 52. By reciprocating these links 51 and 52, the die structure, consisting of and carrying said dies 42 and 43, is made to reciprocate vertically. This structure for operating the dies in proper timed relation with the other mechanism may be any mechanical means found desirable for the purpose, here shown as comprising the cam wheel 53 mounted upon the shaft 24 and rotating therewith and with the gear 29. The cam wheel 53 operates a lever 54, properly pivoted to move the link 55 which in turn operates a bell crank lever 56. This bell crank lever 56 is attached to a shaft 57 which extends transversely across the machine and operates a similar bell crank lever 58 upon the opposite side. These bell crank levers 56 and 58 connect with links 59 and 60 which are pivoted as indicated at 61 in Figure 1 to the links 51 and 52. The movement of the bell crank levers 56 and 58 is such that the links 59 and 60 are raised on an arc whereby the pivot points 61 follow the curved arrow and thereby raise and lower the bar 50 and its associated die structure.

The die blocks 44 and 45 also serve as supports for the fabric feeding mechanism which feeds strips of fabric 62 from the rollers 63 and 64 to proper position for engagement by the cutting dies 42 and 43.

This fabric feeding structure comprises a plurality of sprocket chains 65, 66, 67 and 68 which travel in properly positioned and milled grooves 69 in the die blocks 44 and 45. These milled parts provide openings 70 for sprockets 71, 72, 73 and 74 which drive said chains 65, 68 respectively and are in turn driven by a sprocket chain 75 making proper contact with all of said sprockets 71 and 74 inclusive and passing over a sprocket 76 upon the shaft 77. A chain tightener 78, as shown at Figure 2, is also employed for taking up the slack in said sprocket chain 75. This shaft 77, which drives the sprocket chain 75, is in turn driven from the gear 28 and for the purpose of proper timing and driving in proper relation, it is preferably accomplished through a pair of idlers 79 and 80 as shown at Figure 15. It is to be understood, however, that any usual mechanical means for accomplishing the purpose is within the scope of the invention.

These several sprocket chains also pass over idler sprockets 81, 82, 83 and 84 set in the milled out parts 85 of the die blocks 44 and 45. The chains carry penetrating feeding members 86 which preferably are employed as part of the links of the chains and are provided with upstanding penetrating points 87. The fabric 62 passing from the rollers 63 and 64 passes first over idler rollers 88 and 89 and then along supporting decks 90 and 91, whereupon it is engaged by the penetrating points 87 of the feeding members 86 and moved along between the adjacent pairs of sprocket chains over the die openings in said block. A rod or roller 92 is provided as a tensioning means, being mounted upon a bifurcated member 93 actuated from the link 60 at the pivot 94 (see Figure 1) which in turn is connected with a lever 95 so that a vertical reciprocating movement is provided. This reciprocation of the roller or rod 92 serves to unwind from the rollers 63 and 64 at the proper time sufficient slack in fabric 62 to enable the feeding mechanism to move it forwardly a step without undue hindrance. It will be noted

that this feeding mechanism is driven from the gear 28 which is driven with a step by step movement from the mutilated gear 29 so that the fabric is fed forward with a step by step movement in timed relation to the rotation of the parts and the reciprocation of the dies so that a proper section of the fabric is fed over the die openings and under the dies when said dies are raised which in their descent sever said fabric. The first disk, as indicated at 62', is cut by the die 43 under the hollow shaft 49 which is in position to receive commodity from the spout 96 of the weighing and delivering mechanism, so that the cutting of the first disk of fabric by the descent of the die 43 is practically simultaneous with the discharge of the commodity through said hollow shaft 49 upon the fabric disk 62', as indicated at 97 in Figure 12. This cutting of the fabric disk by the descent of the dies also impales it upon the penetrating points 34 and subjects it and the commodity thereon to the action of the exhaust whereby the fabric disk and the commodity are held to position for further operation. As the turn table rotates a fourth of a revolution, it is brought under the die 43 and a second fabric disk 62'' is cut and impaled upon the penetrating points 34 over and upon the commodity thereon.

A sewing machine, indicated conventionally at 98, (see Figure 2) is employed to stitch about the edge of the superposed fabric disks with preferably an overstitch indicated at 99 in said Figure 2 and Figure 12. This completes the bag with the commodity contained therein which said bag is in accordance with co-pending application Sr. No. 734,350, filed August 26, 1924. The sewing of this bag is accomplished at the third step in the rotation of the turn table 27. At the fourth step the completed bag is removed from the machine by the kick-off mechanism shown in detail at Figure 14 and in elevation and in perspective at Figure 1. This kick-off mechanism comprises a bifurcated lever 100 fulcrumed at 101, the fingers of said lever being properly proportioned to span one of the cups 33 by forcing downwardly the overhanging edges of the bag and assuming a position under the bag, then lifting to engage the edges of the bag to lift it off of the cup, it having been heretofore explained that the action of the exhaust upon the cup, bag and commodity has been relieved.

To oscillate this kick-off, a gear 102 is attached to the pivot shaft 101 and a rack 103 is held in engagement with said gear by means of an idler 104. The rack 103 extends downwardly and is pivotally connected with a bell crank lever 105 which is in turn connected with the link 59 so that, as the link 59 is oscillated and reciprocated by the bell crank lever 56, it in turn actuates the bell crank lever 105 and rack 103 to oscillate the kick-off 100 in proper timed relation to the movement of the turn table, it being understood, of course, that the kick-off normally stands at vertical or approximately so while the turn table is rotating and oscillates through a complete cycle of operation only while the turn table is at rest. Proper mounting and supporting devices for the kick-off are indicated by the upright 106 and brace 107, it being understood of course that any other convenient and approved type of mounting would be the full equivalent of this specific means of mounting said oscillating kick-off.

To properly function, it has been found that a specific type cutting die is of great advantage. The type of die found best adapted for the purpose comprises a sleeve which is preferably substantially a closed cylinder with, however, an interval indicated at 108 to provide for the proper expansion of the die into engagement with the guide block and die blocks. Within the cutting sleeves 42 and 43, rings 109 and 110 are employed. The die 43 which cuts the first disk of fabric carries the ring 110 which has a central opening of sufficient size to permit the tubular shaft 49 to extend downwardly therethrough and is provided with an annular furrow 111 to accommodate the upstanding penetrating points 34 of the cups. As this die and ring descend in cutting position, the disk of fabric severed thereby is forced downwardly upon the penetrating points and the downwardly extending end of the hollow shaft 49 extends downwardly into the dished part of the cup which is now subjected to exhaust at the time the commodity is introduced so that the lower end of said hollow shaft is in engagement with the fabric and the commodity is not allowed to rebound from the discharge upon said fabric. As the die and hollow shaft are raised, the commodity and fabric are held in proper position by the exhaust which is operating upon said commodity and fabric. The ring 110 also serves as a means for stiffening the cutting die 43, and as a means for connecting it to the hollow shaft 49 the pintles 112 being employed inserted through openings 113.

The ring 109 in the die 42 is dished in its under side so that as it forces the fabric disk downwardly upon that already placed upon the penetrating points, the bulge produced by the commodity is accommodated in the dished out portion 114 in said ring, an opening 115 being provided so that the exhaust is not interrupted. This ring 109 is likewise provided with the annular groove 111 for the accommodation of the penetrating points. The forcing of the second disk downwardly upon the first disk does not,

therefore, interrupt the action of the exhaust upon the commodity and superposed disks.

The opening 108 in the die is intended to be at the side of the structure farthest removed from the supporting rollers 63 and 64 and at what will be then the extreme end of the fabric fed so that there is at that point nothing for the dies to cut. This makes provision for the proper resiliency of the die to always fit the guide and die blocks without producing an interval where threads are not cut and therefore interrupt the proper functioning of the die.

The cutting edge of the die is in each case sections 116 which coincide with outer perimeter of the cylindrical die. Intermediate these coinciding sections the edge is scolloped as indicated at 117, the bevel of the two parts forming the two edges 116 and 117 being indicated by the full and dotted lines at Figure 11. This formation of the cutting edge has been found from experience to operate satisfactorily and is believed to be an improvement in cutting dies.

To properly enable the sprocket chains and the feeding members 86 to function, the die blocks 44 and 45 are spaced away from the guide block 41 by means of spacers 118, openings 119 being provided with the blocks 44 and 45 for properly securing these spacers in position and for securing the die blocks to the guide block, said openings accommodating the screws or bolts in the usual well known manner.

In operation, while the turn table 27 is at rest, the fabric strips are fed forward by the sprocket chains and feeding mechanisms 86 until the ends of said fabric strips are over the openings in the die blocks 44 and 45 and immediately under the raised dies 42 and 43. In this position the dies descend cutting simultaneously two disks from the extreme end of said fabric strips, which said disks are forced downwardly upon the penetrating points of the underlying vacuum cups, then positioned immediately beneath said die openings. Simultaneously the weighing and dumping mechanism, which does not enter into the present invention, is properly actuated to dump a charge of commodity through the hollow shaft 49 upon the fabric disk severed and positioned by the die 43, which said fabric and the deposited commodity are subjected to exhaust produced by the exhaust mechanism 40 and in communication with the conduit 39.

The dies 42 and 43 raising, the turn table 27 is advanced a fourth of a revolution, which brings the first positioned fabric disk and the deposited commodity under the die 43. The dies again descending, the same process is repeated by the die 43 and its associated parts and a fabric disk is severed by the die 42 and impaled upon the penetrating points 34 over and upon the deposited commodity. The commodity is then inclosed between two disks, both of which are impaled upon the penetrating points and their perimeters superposed. The next quarter rotation of the turn table 27, the same process is repeated by the two dies and their associated parts and the previously filled cup is subjected to the action of the sewing machine 98 which sews about the overhanging superposed edges of the disk and over-stitching, completely inclosing the commodity in the thus completely sewed about bag. The next quarter rotation of the turn table 27 all of the hereinbefore described functions are repeated and the completed bag is moved to the fourth position where it is acted upon by the kick-off which at this point descends by pressing down the overhanging sewed edges of the bag until the fingers are under such edges and then quickly raising to throw off the bag. This completes one entire cycle of operation of the machine and further actions of the machine are merely repeats and continuations of the cycle just described.

What I claim to be new is:

1. In a bagging machine, a turn table, means to rotate the turn table with a step by step movement, a plurality of groups of penetrating points carried by said turn table, a cutting die positioned to operate in conjunction with one group of penetrating points, means to feed a strip of fabric into position to be acted upon by said die, and means operating in timed relation to the step by step movement of the turn table and the die to produce a slackness in said fabric strip.

2. In a bagging machine, a turn table, a plurality of groups of penetrating points upstanding from said turn table, a plurality of cutting dies positioned to coact with a like number of groups of penetrating points, means to feed an independent strip of fabric to each of said cutting dies, means to advance said strip with a step by step movement in timed relation to the movement of other parts of the mechanism, and means operating also in timed relation to relieve the tension upon the said strips while being operated upon by the cutting dies.

3. In a bagging machine, a plurality of associated cutting dies, sprocket chains mounted adjacent the dies, fabric engaging mechanisms carried by the sprocket chains, and penetrating points carried by said sprocket chains for engaging the margins of said strips of fabric.

4. In a bagging machine, adjacent cutting dies, a pair of sprocket chains for each cutting die, the proximate folds of said sprocket chains moving toward the die with a step by step movement in timed relation to the operation of the die, fabric engaging

members extending from said proximate sides of the sprocket chain toward each other, and fabric penetrating points carried by said engaging members.

5. In a bagging machine, a fabric feeding sprocket chain, some of the links of which chain comprise laterally extending plate-like portions, and penetrating points upstanding from said plates above the plane of said chain.

6. In a bagging machine, a pair of sprocket chains mounted to operate in the same plane, said chain comprising links, some of which are composed of plates extending inwardly from each chain, toward its proximate chain, and fabric penetrating points upstanding from said plates above the plane of the chains.

7. In a bagging machine, a part rotated with a step by step movement, a pair of cutting dies, a frame carrying said dies, a guide carried by said frame, and power transmitting means from said step by step actuation to reciprocate the die carrying frame.

8. In a bagging machine, a pair of tubular dies, shafts extending upwardly axially from said dies, a cross-head connecting said upwardly extending shafts, a guide member carried by said crosshead, a bar connecting said shafts, links operating upon the opposite ends of said bar, and means for transmitting reciprocating intermittent impulses to said links.

9. In a bagging machine, a cutting die, a hollow exhaust shaft extending downwardly through said die, a ring in said die provided with an annular groove, a suction cup, means to position the suction cup properly beneath said die, and penetrating points carried by said suction cup positioned to be accommodated in said annular groove.

10. In a bagging machine, a plurality of adjacent cutting dies, a hollow shaft extending downwardly through one of said dies, rings within said dies provided with annular grooves and one of said rings accommodating said hollow shaft, a turn table, suction cups carried by said turn table, means to rotate the turn table with a step by step movement and reciprocating said dies to properly position suction cups beneath said dies, and penetrating points upstanding from said suction cups properly positioned to be accommodated in said annular grooves.

11. In a bagging machine, a cutting die composed as a cylinder open at one side, the cutting edge comprising segments corresponding to the perimeter of the cylinder interspersed by scollops having a different angle and forming insets at the perimeter of said die.

12. A cutting die comprising an open-sided cylinder, the cutting edge being composed of segments corresponding to the perimetrical edge of said cylinder interspersed by sections of more obtuse angles producing scollops intermediate said segments, the edges of said scollops also coinciding with the perimeter of said cylinder.

13. In a bagging machine, a turn table, a plurality of suction cups carried by said turn table, penetrating points upstanding from adjacent the perimeters of said suction cups, means to produce and fill a bag of commodity upon said cups and impaled upon said penetrating points as said turn table rotates, and a kick-off comprising a bifurcated arm proportioned to pass downwardly upon opposite sides of the suction cup, and means to raise said bifurcated arm to lift the completed bag out of engagement with said penetrating points.

14. In a bagging machine, a turn table provided with a plurality of spaced suction cups, each of said cups provided with upstanding penetrating points adjacent its perimeter, means to rotate the turn table with a step by step movement, mechanism for filling and closing a bag upon said suction cups and impaled upon said penetrating points as said turn table is advanced, a kick-off positioned adjacent the perimeter of said turn table and comprising fingers spaced to span one of said suction cups, and means actuated from the turn table rotating mechanism to force said fingers downwardly under the completed bag upon said cup and to raise it to discharge said bag from said cup during an interval of rest of said turn table.

15. In a bagging machine, a kick-off comprising a bifurcated arm, means fulcruming said arm, a pinion carried by the fulcrum mechanism, a rack in engagement with the pinion, and means to reciprocate the rack to oscillate the arm.

In testimony whereof I affix my signature.

WALTER M. INGRAM.