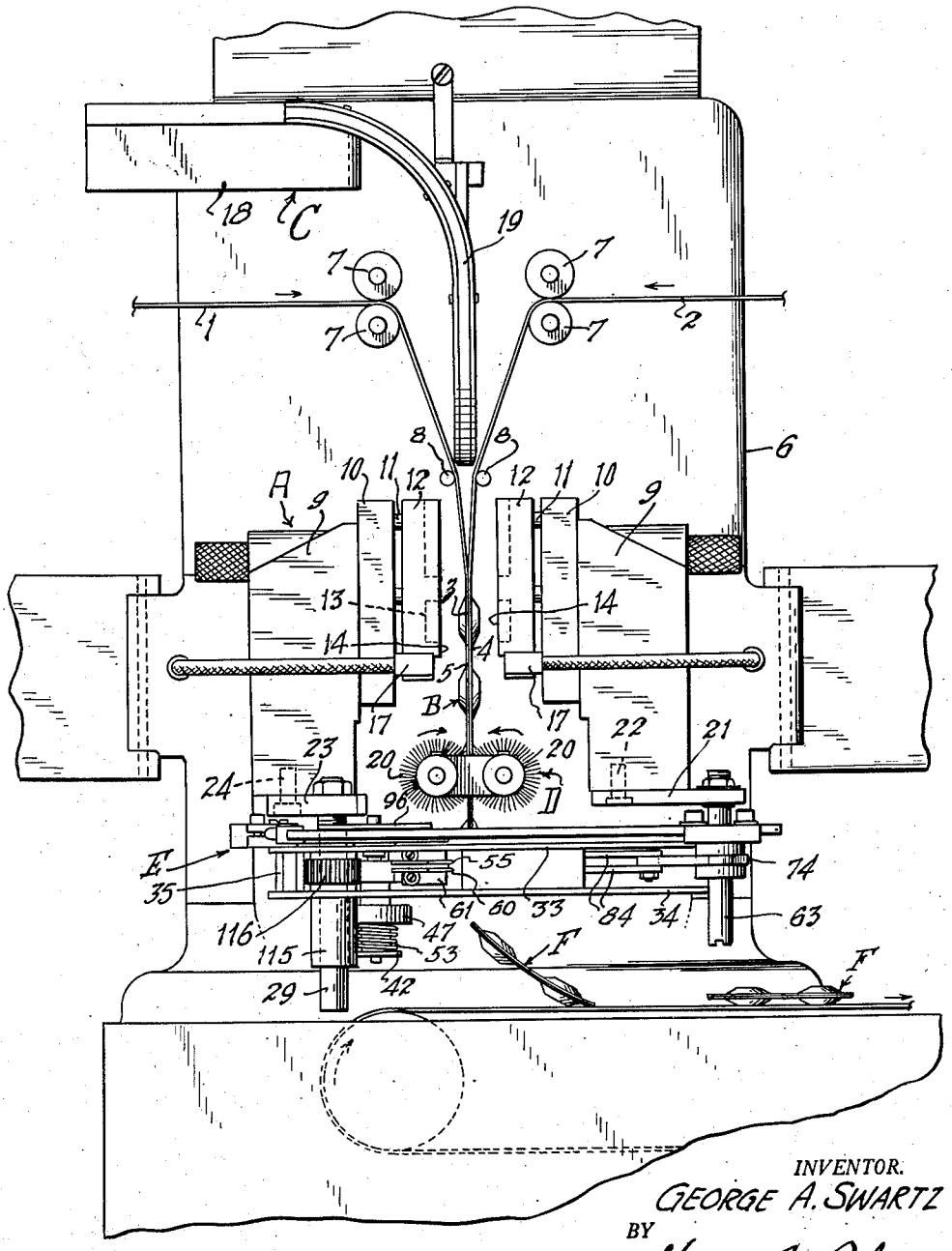
March 11, 1958 G. A. SWARTZ 2,826,025

MACHINE FOR MAKING AND FILLING SEALED PACKAGES

Filed July 22, 1954 4 Sheets-Sheet 1

Fig. 1.



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MACHINE FOR MAKING AND FILLING SEALED PACKAGES

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Fig. 2.

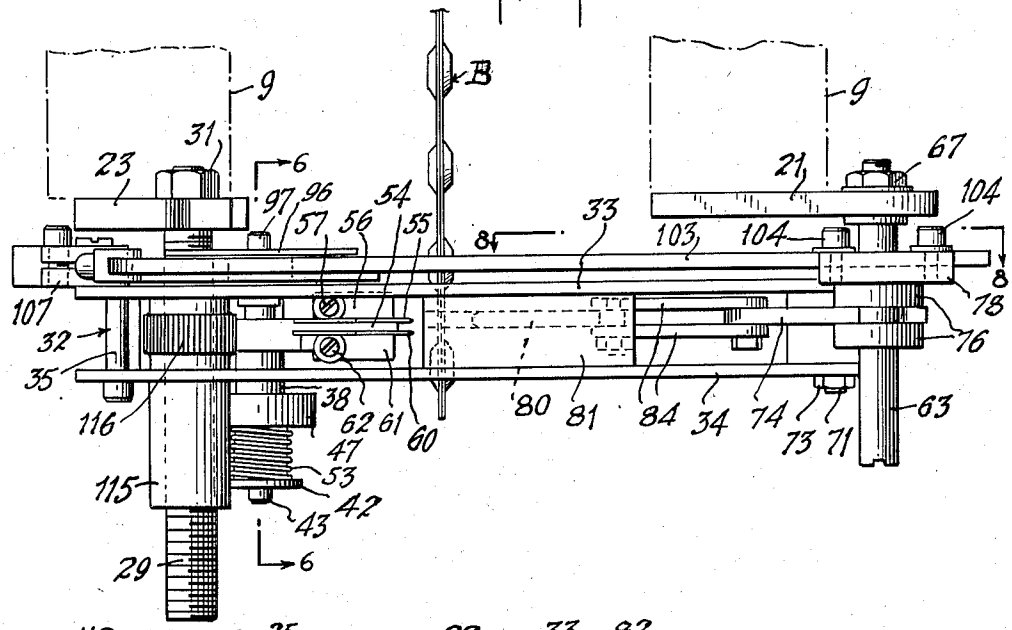


Fig. 3.

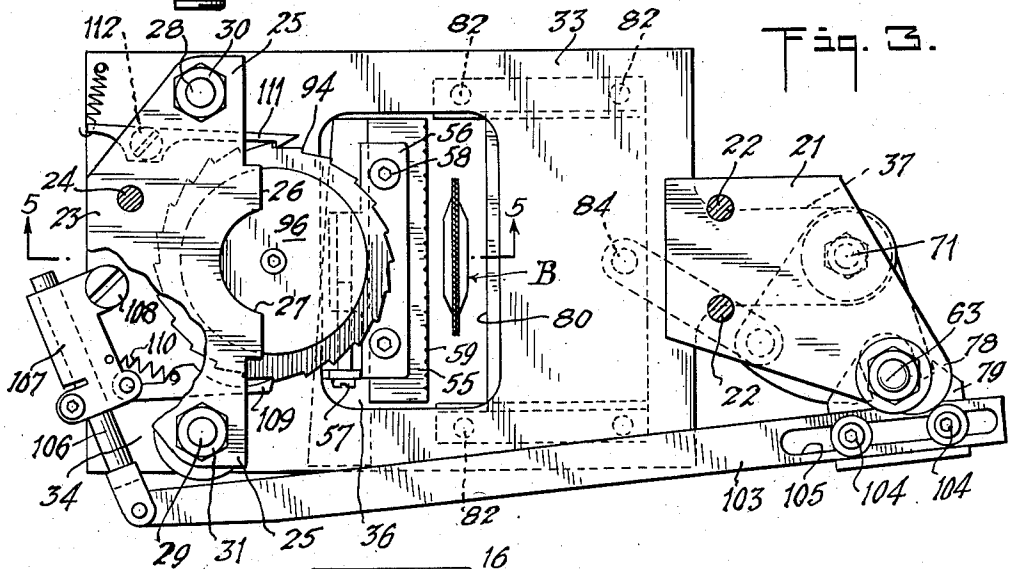
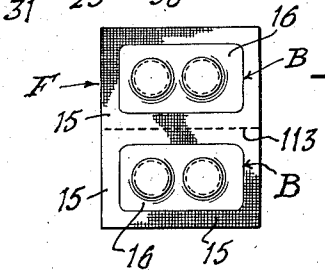


Fig. 4.



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Fig. 5.

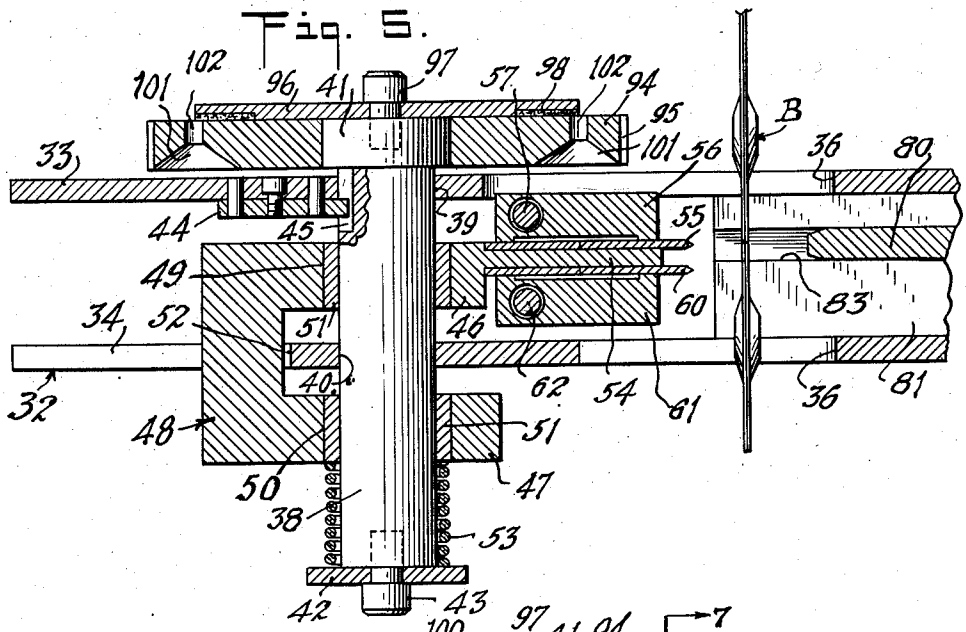


Fig. 6.

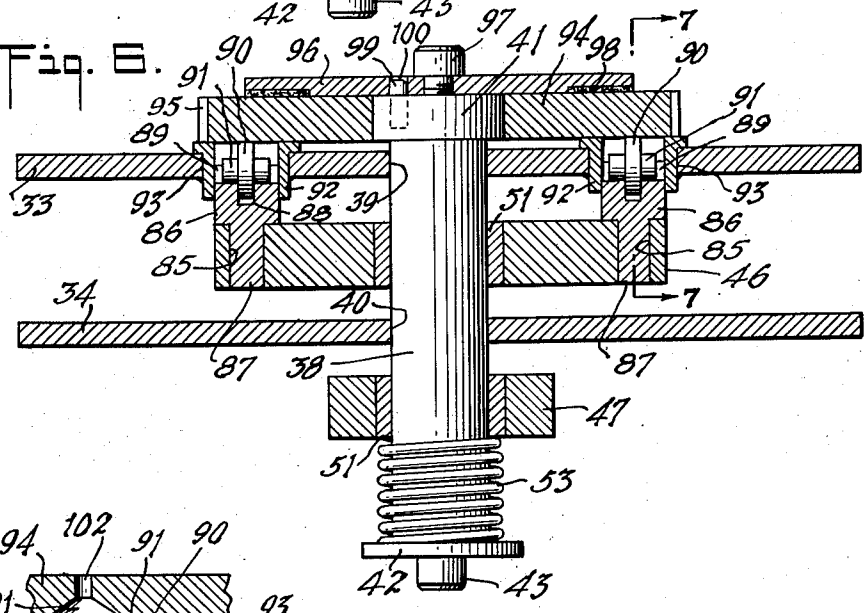
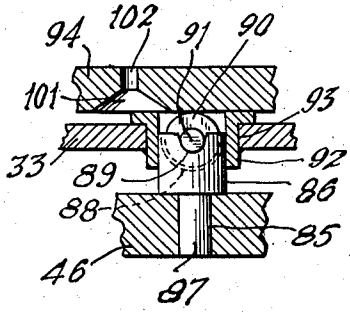


Fig. 7.



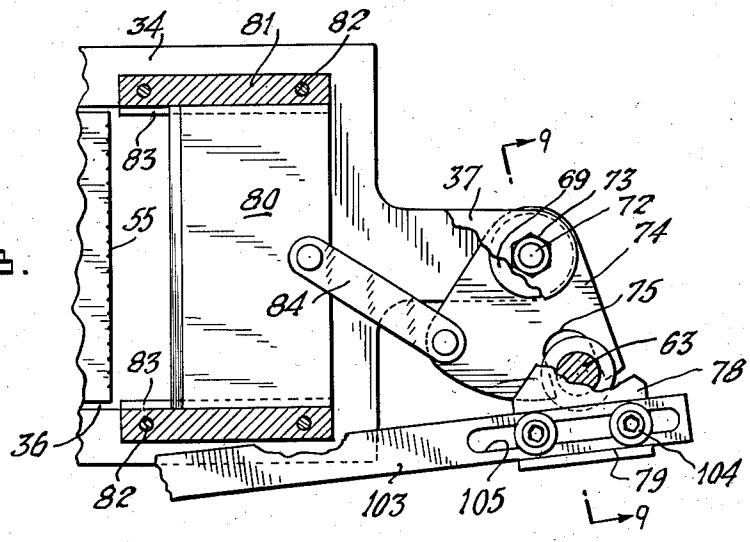
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Fig. 8.



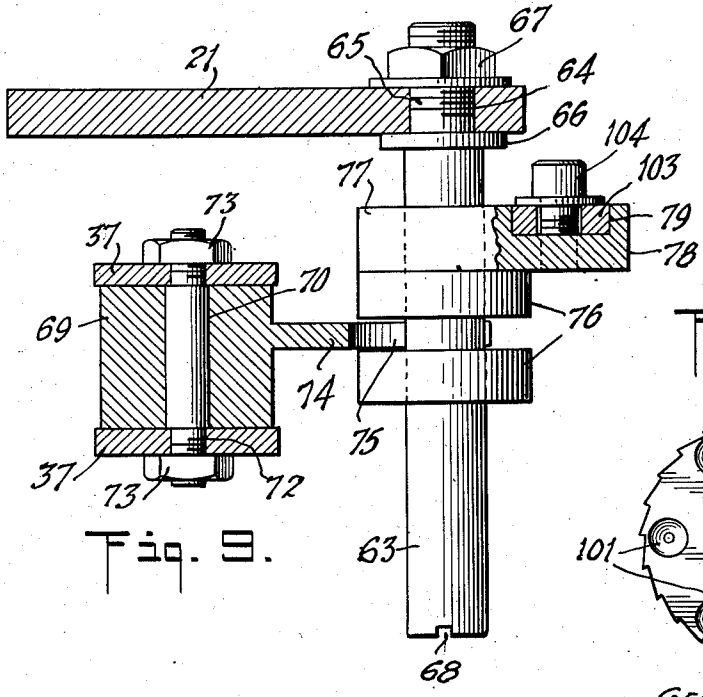
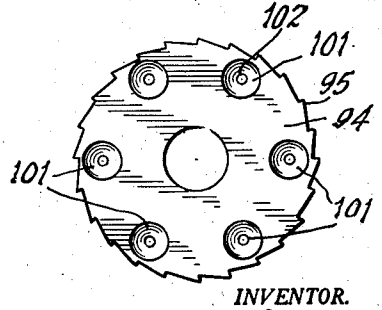


Fig. 9.

Fig. 10.



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2,826,025

MACHINE FOR MAKING AND FILLING SEALED PACKAGES

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Application July 22, 1954, Serial No. 445,001

3 Claims. (Cl. 53—180)

This invention relates in general to the making and filling of packages from two layers of packaging material, for example, strips of cellophane, Pliofilm, metal foil, paper, or the like, and more particularly the invention contemplates a machine for making such packages wherein two layers of packaging material are fed into juxtaposition and sealed together to form a package or bag having an upwardly facing open end after which an article or commodity is inserted into the package or bag and then the said open end of the package or bag is closed, a plurality of such packages or bags being made in succession from continuous strips of packaging material. In general, the invention relates to a package and machine of the general type shown in Patents Nos. 2,350,930 and 2,606,412 dated June 6, 1944, and August 12, 1952, respectively. In the machines disclosed in these patents, the strips of material are moved through the machine between cooperating sealing dies with a step by step motion, and at the end of each step of movement, the dies press the strips together simultaneously along their longitudinal margins and transversely to form a rectangular bag-like container having an open end, the two sides and bottom of the bag being formed by the longitudinal and transverse seals, respectively, and the open end being formed between the unsealed portion of the strips at the upper ends of said longitudinal sealed zones. At the same time, the open end of the next preceding bag-like container is sealed by again sealing the strips transversely between the upper ends of said longitudinal sealed zones. The last-mentioned bag-like container is then severed from the adjacent partially formed bag-like container. A single bag-like container having a single compartment is thus made, filled and severed.

It is desirable however to produce and market units having a plurality or chain of complete packages integrally formed, each package containing a compartment. Such units or strips however present difficulty to the user in separating or severing one package from its adjacent package. Therefore a prime object of the present invention is to provide a machine of this character with novel and improved mechanism for selectively severing units or strips comprising a chain of two or more complete packages, with scored lines or lines of perforations between adjacent packages whereby the packages may be manually and readily severed by the user.

Other objects and advantages of the invention will appear from the following description in conjunction with the accompanying drawings in which—

Figure 1 is a fragmentary front elevational view of a machine embodying my invention.

Figure 2 is a fragmentary front elevational view of the scoring and severing mechanism, on an enlarged scale.

Figure 3 is a top plan view of the scoring and severing mechanism shown in Figure 2, parts being broken away for the sake of clearness.

Figure 4 is a plan view of one type of package that can be formed with my machine.

Figure 5 is an enlarged horizontal sectional view taken on the plane of the line 5—5 of Figure 3.

Figure 6 is an enlarged vertical sectional view taken on the plane of the line 6—6 of Figure 2.

Figure 7 is a vertical sectional view taken on the plane of the line 7—7 of Figure 6.

Figure 8 is a horizontal sectional view taken on the plane of the line 8—8 of Figure 2.

Figure 9 is an enlarged vertical sectional view taken on the plane of the line 9—9 of Figure 8.

Figure 10 is a plan view of the ratchet or indexing wheel.

Broadly, the invention contemplates a machine that utilizes two strips 1 and 2 of suitable packaging material which are drawn step by step from supply rolls into juxtaposition or side by side relation by suitable feeding mechanism, such as the rolls and feeding mechanism disclosed in Patent No. 2,606,412.

At the end of each step of movement, the two strips 1 and 2 are sealed together by sealing mechanism A along their longitudinal edges, as indicated at 3, and transversely, as indicated at 4, to form a bag-like receptacle having an open end or mouth facing upwardly between the strips. Simultaneously, said strips are sealed together transversely, as indicated at 5, of said open end of the next preceding bag-like receptacle that was formed at the end of the immediately preceding step of movement, so as to form a complete package B.

In the interval between the steps of movement and after the partial formation of each package above described, the substance or article to be packaged is deposited by a filling mechanism C into the mouth of the preceding bag-like receptacle.

The feeding mechanism draws from the supply rolls, at each step, predetermined quantities of the strips 1 and 2 required to form a single package, and an auxiliary feeding mechanism D constantly exerts tension on the strips so as to draw said quantities of the strips downwardly into proper position relative to the sealing mechanism A, and at the same time moves the package strip or chain of bag-like receptacles downwardly into the scoring and severing mechanism E.

As illustrated, the strips 1 and 2 are fed transversely across the main frame 6 of the machine between pairs of guide rollers 7 and downwardly over guide rollers 8, the two strips being thus brought into juxtaposition or opposed side by side relation to each other and guided toward the sealing mechanism A, and subsequently the auxiliary feeding mechanism D draws the strips downwardly through the sealing mechanism.

The sealing mechanism is shown as including two sealing jaws or blocks 9 which are mounted to reciprocate toward and from each other in a horizontal plane by any suitable mechanism, such as the mechanism shown in Patent No. 2,350,930. The two jaws or blocks 9 are substantially identical in construction and each includes a body portion 10 on which is mounted, as by bolts 11, a crimping and sealing block 12, whereby the sealing block may have movement relative to the body portion 10.

Each sealing block 12 has a recess 13 in its face which is surrounded on three sides by a corrugated or serrated rim 14. Where the package is to be approximately rectangular in shape, as shown, the corrugations are arranged on the rim of the sealing block in a manner corresponding to three sides of the rectangular package. In the present instance, the package is rectangular in shape as shown in Figure 4, the package having the packaging material crimped and sealed along the four edges of the package as at 15 to provide a compartment 16 within the sealed edges and between the two strips

of packaging material to receive the substance being packaged.

In forming the packages, the sealing blocks 12 are first separated as shown in Figure 1 and the packaging strips 1 and 2 are pulled downwardly into juxtaposition between the sealing blocks. Thereupon, the sealing blocks are moved toward each other by suitable mechanism such as shown in Patent No. 2,350,930 so as to cause the corrugated rims 14 to press the strips 1 and 2 together and partially form a package or bag-like receptacle having its upper end open between the strips at the upper ends of the sealing blocks. In other words, the two strips 1 and 2 are sealed together along their longitudinal margins 3 and transversely as at 4, to form the bag-like receptacle which is open at its top.

Where the strips 1 and 2 are of thermoplastic material or have a thermoplastic coating on their adjacent sides, the sealing blocks 12 will have suitable electric heaters 17 (well known in the art) for heating the blocks to soften or fuse the thermoplastic material and seal the strips together. Where the edges of the strips are provided with adhesive, the heaters may be omitted.

After the strips have been sealed as above described, the sealing blocks are separated and the portions of the packaging strips that will have been supplied by the feeding mechanism for the next package will be pulled downwardly by the auxiliary feeding mechanism D preparatory to the partial formation of the next package. Then the material to be packaged is released from the hopper 18 of the filling mechanism C and guided through chute 19 and deposited through the open end into the partially completed package.

Thereupon another package will have been partially completed as above described, and as the sealing blocks 12 are brought together for this purpose, the open end of the first formed package will be closed and sealed by the transverse portions of the corrugated rims 14.

As hereinbefore described, the package strips 1 and 2 are constantly pulled downwardly by the auxiliary feeding means D to advance the strips as the package are formed in succession, and as shown, said feeding means comprises two rotatable cylindrical brushes 20 which receive the package strips between them, the bristles yieldingly and frictionally exerting pressure on opposite sides of the strips so that as the brushes are rotated by any suitable means in the direction indicated by arrows in Figure 1, the package strips will be placed under tension and pulled downwardly.

In accordance with the present invention, the machine is provided with mechanism for severing a unit or a package strip having a plurality of integrally connected complete bag-like receptacles with scored or perforated lines between adjacent receptacles so as to facilitate severing of the receptacles from the unit or strip manually by the user. This scoring and severing mechanism is supported below the sealing mechanism by a substantially triangular-shaped plate or bracket 21 secured at its base portion to one of the movable jaws or blocks 9 of the sealing mechanism A by spaced bolts 22 and projecting laterally and outwardly therefrom. Another plate or bracket 23 is secured to the other movable jaw or block 9 of the sealing mechanism by spaced bolts 24. Plate 23 is substantially rectangular in shape with extensions 25 at its ends and with an enlargement 26 along one edge midway its ends, said enlargement being formed with a curved edge 27. A pair of screw-threaded bolts 28 and 29 extend through openings in the extensions 25 of bracket 23 and depend therefrom and are fastened thereto by nuts 30 and 31, respectively. An auxiliary frame indicated generally at 32 is adjustably supported by the bolts 28 and 29. This auxiliary frame includes upper and lower rectangular-shaped plates 33 and 34, respectively, which are held in spaced relation by posts 35 adjacent the bolts 28 and 29. Midway their ends, the plates are formed with aligned openings 36. At their opposite ends, the plates 33 and 34 are formed with aligned central extensions 37.

As shown in Figure 5, a shaft member 38 extends centrally through aligned openings 39 and 40 in the plates 33 and 34, respectively, and is formed with an enlargement or head 41 at its top above plate 33. A disk 42 is secured to the bottom end of the shaft by a headed bolt 43 and projects outwardly of the periphery of the shaft. A finger piece 44 is secured to the underside of the upper plate 33, adjacent its opening 39, and projects into a slot 45 formed in the periphery of the shaft, adjacent its head, to prevent rotation of the shaft.

The shaft member 38 extends loosely through the horizontal upper and lower arms 46 and 47, respectively, of a substantially C-shaped bearing member 48, the openings 49 and 50, respectively, in said upper and lower arms having bearing sleeves 51. The body of the C-shaped bearing member extends through an opening 52 formed in the lower plate 34 of the auxiliary frame. A compression spring 53 is sleeved around the shaft member 38 below the lower plate 34 and has one end seated on the disk 42 and its other end impinges against the sleeve 51 of the lower arm 47 of the bearing member whereby said bearing member is urged upwardly along the shaft member 38.

An integral extension 54 is formed on the upper horizontal arm 46 of the bearing member 48 and projects toward the openings 36 in the plates 33 and 34. An elongated blade 55 is seated on the upper surface of the extension 54 and is clamped thereon by a T-shaped block 56 which is secured to the bearing member 48 by screws 58. Screws 58 and block 56 clamp the blade to the extension 54. Blade 55 is formed with spaced notches 59 along its outer projecting edges and serves as a scoring or perforating blade. A similar shaped blade 60, with a continuous cutting edge, is clamped against the under surface of the extension 54 by a block 61, similar in shape to the block 56, which is secured to the bearing member 48 by the screws 58.

A shaft 63 extends through an opening 64 in the outer end of the bracket arm 21 and depends therefrom. The shaft is formed with a reduced threaded upper end 65 forming a flanged shoulder 66 upon which the bracket arm 21 rests. A nut 67 fastens the shaft to the bracket arm. The other end of the shaft may be formed with a slot 68 to receive a turning tool. A lever member having a cylindrical body 69 formed with a central passage 70 is disposed between the outer ends of the extensions 37 of the plates 33 and 34. A bolt 71 extends through openings 72 in the plates 33 and 34 and through the passage 70 and is threaded on both ends to receive nuts 73 for fastening the lever member to the plates. The body 69 is formed midway its ends with a laterally extending triangular-shaped lever arm 74 which is formed at one corner along its periphery with an elongated radial slot 75. The slotted end of the lever member spans the shaft 63, between spaced annular flanges 76 on the shaft intermediate its ends.

The shaft 63 also extends through the triangular shaped extension 77 of a rectangular-shaped bracket arm 78, the body of the bracket arm extending outwardly of the outer end of the lever arm 74. The bracket arm 78 is formed with an elongated groove 79 along its outer end for a purpose which will be later described. A platen member 80 is reciprocally mounted between the ends of the plates 33 and 34 of the auxiliary frame adjacent the bracket arm 21. The platen member moves through an elongated guide member 81 secured to the plates 33 and 34 by spaced bolts 82, along tracks 83 formed on the guide member. The platen member is connected to the reciprocable bracket arm 74 by pivoted links 84.

Midway the ends of the upper horizontal arms 46 of the bearing member 48, along the edges of its opposite sides, there are a pair of opposed openings 85. Cylin-

drical blocks 86 are seated on the side edges of the upper arm 46 of the bearing member 48 by means of integral stems 87 fitted in the openings 85 therein. The upper surface of each block is formed with intersecting slots 88 and 89 for loosely receiving a roller 90 and its shaft 91, respectively. The blocks are arranged in line with flanged sleeves 92 fitted in openings 93 in the upper plate 33 of the auxiliary frame and secured therein by welding or the like.

A ratchet or indexing wheel 94 is removably and rotatably mounted on the annular head 41 of the shaft 38 and normally rests on the flanged ends of the sleeves 92 mounted in the upper plate 33. The wheel is formed with a series of spaced teeth 95 on its periphery. A circular plate or disk 96 is secured to the head 41 of the shaft 38 by a headed screw 97 and presses the ratchet wheel downwardly, there being a friction ring 98 secured to the under side of the disk 96 and engaging the wheel 94 adjacent its periphery. A pin 99 protruding from the upper surface of the head 41 of the shaft into an opening 100 in the plate 96 prevents relative movement of the head and plate. At spaced intervals, on the bottom surface of the ratchet wheel, along its periphery, there are a series of spaced depressions 101 having tapered walls communicating with holes 102 opening out through the top surface of the wheel. The solid portion of the ratchet wheel is normally in engagement with the rollers 90 as shown in Figure 6 thereby forcing the bearing member 48 with its blades 55 and 60 downwardly to lowermost position against the action of spring 53 so that the upper perforating or scoring blade 55 is normally in line with the platen member 80.

The mechanism for rotating the ratchet or indexing wheel 94 step by step includes an elongated lever bar 103, one end of which is seated in the groove 79 in the bracket arm 78 and is connected thereto by headed bolts 104 passing through an elongated slot 105 formed in the end of the bar. The other end of the lever bar is pivotally connected to one end of a rod 106 adjustably fastened to a split clamping sleeve 107 which is pivotally fastened to the upper plate 33 of the auxiliary frame as indicated at 108. A pawl 109 has one end pivotally secured to the clamping sleeve 107 and with its other end normally held in impinging engagement with the teeth 95 of the ratchet wheel 94 by a spring 110. Backward rotation of the ratchet wheel is prevented by a spring pressed pawl 111 pivotally secured to the upper plate 33 as indicated at 112.

During each sealing operation, the sealing jaws or blocks 9 carry the brackets 21 and 23 toward each other thereby moving the auxiliary frame 32 with its C-shaped bearing member 48, mounting the blades 55 and 60, and the platen member 80 toward each other. The ratchet wheel 94 controls the operative position of the blades 55 and 60 relative to the platen member 80. The solid portion of the wheel is normally in engagement with the rollers 90 of the bearing member 48 thereby normally forcing the bearing member downwardly so as to normally position the scoring or perforating blade 55 in aligned operative position with the platen member so that the parts of the machine are normally set for scoring or perforating the packaging strip. The number and spacing of the depressions 101 on the ratchet wheel control the number of bag-like receptacles or packages comprising the unit or strip and thereby the size of the unit or strip to be severed from the packaging strip.

The ratchet wheel 94 shown in Figure 10 is formed with three pairs of opposed depressions 101 or six depressions so arranged and spaced that the scoring blade 55 and the severing blade 60 are alternately brought into operative position with the platen member so that during one sealing operation the scoring plate 55 is in operative position and the transverse zone of the receptacle is scored or weakened. Upon the next succeeding sealing operation, a pair of depressions will have been moved into alignment with the rollers 90 thus releasing the pressure on the spring 53, permitting the spring to push the bearing member 48 with the blades upwardly so as to carry the lower blade 60 into aligned operative position with the platen member thereby severing a unit or strip F such as shown in Figure 4, containing a chain of two integrally connected complete packages or bag-like receptacles B with a score or perforated line 113 formed between the packages. The severed units or packages drop onto an endless belt conveyor 114 from which the units or packages may be removed.

The auxiliary frame 32 may be adjusted vertically on the shafts 28 and 29 by an elongated adjusting sleeve 115, with integral actuating nut 116, screw threaded on the shaft 29 so that rotation of the nut in one direction or the other will raise or lower the auxiliary frame, and associated parts.

It will be understood that the indexing wheel 94 may be readily removed and if it is desired to produce a unit or strip containing a chain of three or more complete packages or receptacles, it is merely necessary to substitute a ratchet wheel with the necessary number and proper spacing of depressions 101 for the wheel 94 shown in Figure 10 in order to delay the movement of the cutting blade 60 to operative position.

While I have shown and described a preferred embodiment of my invention, it will be understood by those skilled in the art that changes in details might be made without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim is:

1. In a packaging machine, the combination with means for guiding a plurality of continuous strips of packaging material longitudinally in one direction into juxtaposition, and sealing mechanism comprising a pair of opposed sealing blocks movable toward and from each other with said strips between them to press and secure said strips together to form a chain of containers, of automatic means for selectively scoring and severing said chain of containers between adjacent containers including a movable bearing member, a scoring blade and a cutting blade mounted on said bearing member and spaced apart longitudinally of the path of movement of said chain of containers, means mounting said bearing member on one of said sealing blocks, a platen mounted on the other sealing block, spring means normally urging said bearing member in one direction to bring the severing blade into operative juxtaposition to said platen, indexing means actuated in timed relation to said sealing blocks to cause movement of said bearing in the opposite direction to bring the scoring blade into operative juxtaposition to said platen, and means for causing relative movement of said platen and blades to cut and sever said chain of packages.

2. In a packaging machine as defined in claim 1, said indexing means including an indexing wheel mounted on said bearing member and operatively connected to one of said sealing blocks for step by step rotation in timed relation thereto, rollers carried by and protruding from the upper surface of said bearing member, said wheel normally overlying said rollers and holding the bearing member against the influence of said spring with the scoring blade in operative juxtaposition to the platen, said wheel having depressions into which said rollers are movable under the influence of said spring to permit movement of the bearing member by said spring to bring the severing blade into operative juxtaposition to the platen.

3. In a packaging machine having movable blocks for sealing and forming two continuous strips of packaging material into a package comprising a chain of closed bag-like containers, mechanism for selectively either scoring or severing the chain of containers between adjacent closed bag-like containers including a movable platen member operatively connected to one of said movable blocks and movable therewith, a bracket connected to the other of said movable blocks and movable therewith,

a frame supported and carried by said bracket, a movable C-shaped bearing member mounted on and carried by said frame, a pair of spaced scoring and severing blades carried by the bearing member, rollers carried by and protruding from the upper surface of the upper horizontal arm of said C-shaped bearing member, an indexing wheel supported by said frame adjacent said bearing member, said wheel normally pressing on said rollers for holding the bearing member with its scoring blade in operative position with the platen member, means of connection between the wheel and one of the movable blocks including a bracket arm, an elongated lever arm connected at one end to said bracket arm, a pawl operatively connected to the other end of said lever arm, and being operatively connected to said wheel, means connecting said lever arm to one of said blocks for oscillating said lever arm, said wheel having spaced depressions for releasing the normal holding engagement of the wheel on the rollers, and a compression spring engaging the bottom horizontal arm of the C-shaped bearing member for moving the bearing member to bring its severing blade into operative position with the platen member upon release of said wheel holding engagement.

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