Oct. 21, 1941. A. TANZI 2,259,943

APPARATUS FOR FABRICATING MACARONI

Filed March 5, 1940 3 Sheets-Sheet 1

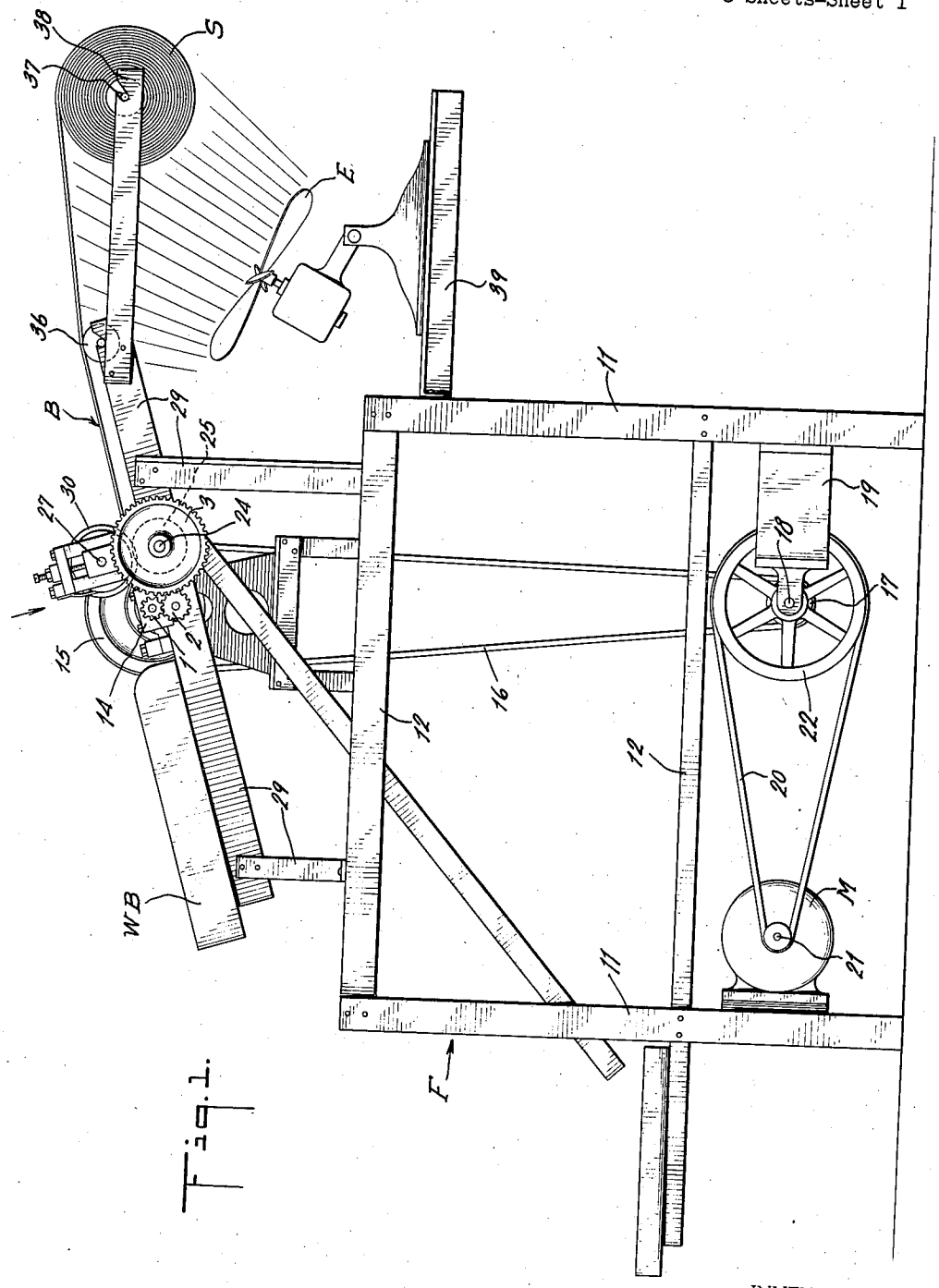


Fig. 1.

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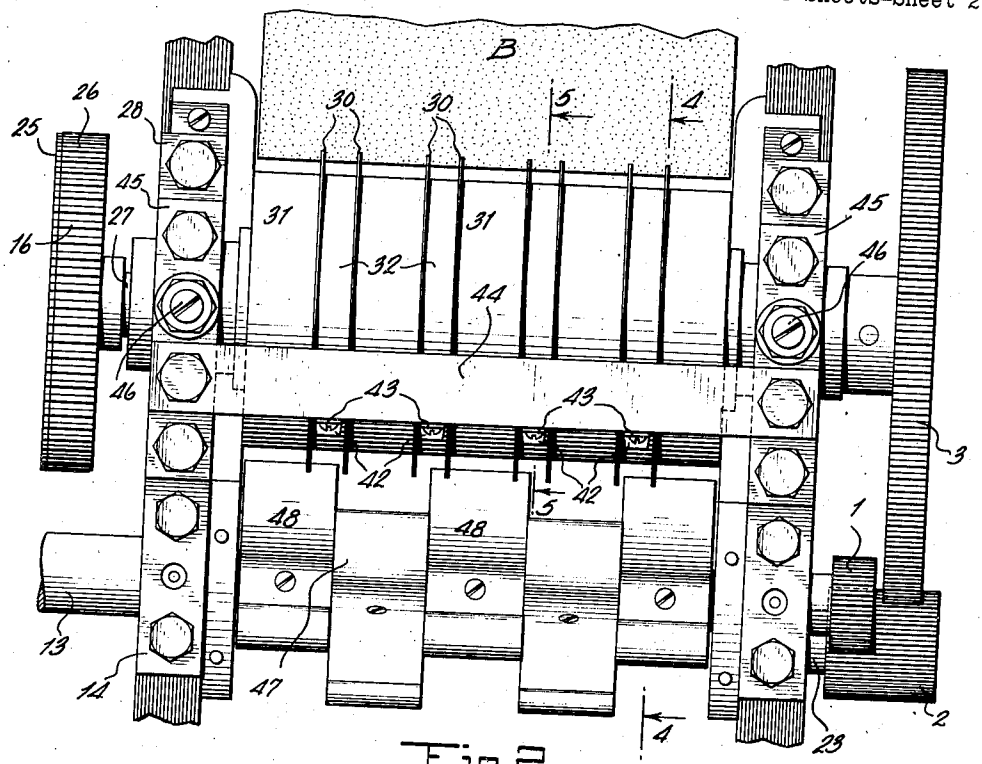


Fig. 2.

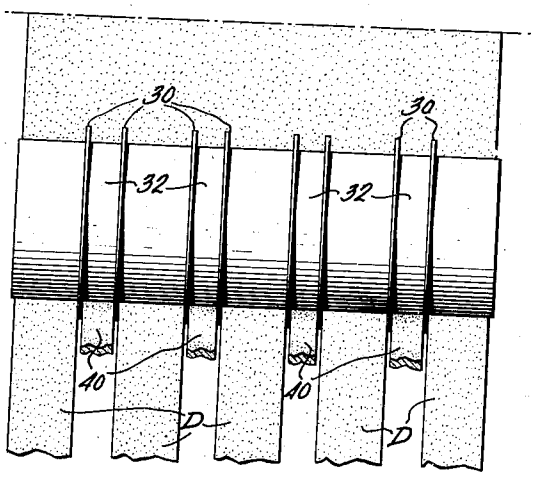


Fig. 3.

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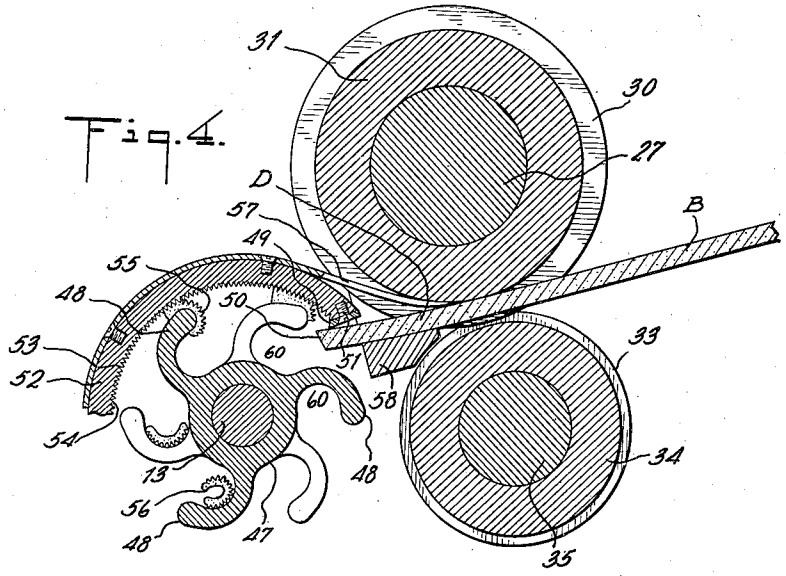
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APPARATUS FOR FABRICATING MACARONI

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Fig. 4.



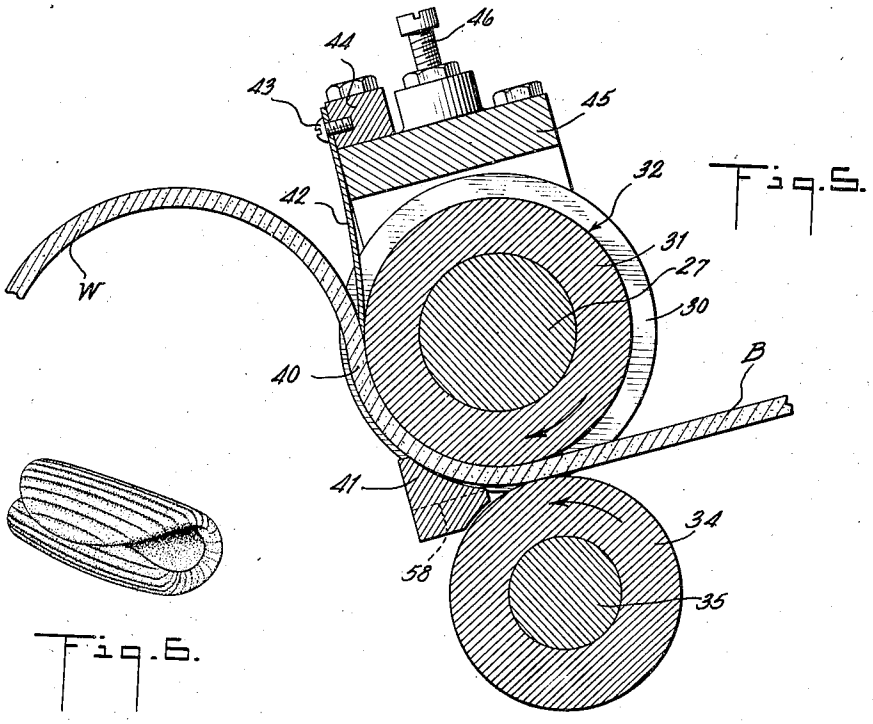


Fig. 5.

Fig. 6.

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Patented Oct. 21, 1941 2,259,943

UNITED STATES PATENT OFFICE

2,259,943

APPARATUS FOR FABRICATING MACARONI

Aurelio Tanzi, New York, N. Y.

Application March 5, 1940, Serial No. 322,332

4 Claims. (Cl. 107—22)

This invention relates to the production from a relatively broad, flat supply strip of dough, of a multiplicity of individual parts thereof, said parts taking the form of macaroni, such, for instance, as those macaroni elements known to the trade as "Cavatelli."

The invention has reference especially to apparatus for the utilization of such a broad, flat supply strip to form a plurality of individualized strip portions, and to fabricate therefrom multiple parts of macaroni or the like, concurrently, thereby to produce such parts at a high output rate.

Accordingly the invention has for an object to divide such a broad web into a series of relatively narrow strip portions and to fabricate each of said strip portions into multiple parts of macaroni or the like.

A further object is to impart to the web of dough, prior to its delivery to the cutting devices, an encrustation upon both sides of the web.

Other objects and features of the invention will appear as the description of the particular physical embodiment thereof selected for disclosure herein proceeds.

In the drawings:

Fig. 1 is a view in side elevation of a machine in the construction of which the present invention is embodied;

Fig. 2 is a fragmentary detail view in plan of parts of the machine shown in Fig. 1, taken upon an enlarged scale, as viewed from the angle indicated by the arrow appearing immediately above Fig. 1, a casing member having been omitted for the sake of clearness in illustration;

Fig. 3 is a schematic detail view showing in operation the delivery of the dough supply web to the cutting and feeding rolls, and the delivery therefrom of the individualized web strips; and shows also the intermediate waste strips as they are being removed;

Fig. 4 is a fragmentary detail view in vertical section taken upon the line 4—4 of Fig. 2;

Fig. 5 is a similar view of schematic character taken upon the line 5—5 of Fig. 2, and

Fig. 6 is a perspective view of the product which it is the purpose of the present invention to fabricate, displayed on a lightly enlarged scale.

In a now-preferred illustrative embodiment of the invention, the reference character F designates generally the frame of a machine for use in the fabrication of macaroni and the like, comprising uprights 11 and horizontal members 12 of suitable number and character to constitute a supporting structure for the operating parts of the machine.

Upon a shaft 13 journalled in bearings 14 is fixed a driving pulley 15 actuated by a belt 16 running from a pulley 17 journalled upon a shaft 18 carried by brackets 19 mounted upon one of the frame uprights 11. The shaft 18 is driven by a belt 20 running from the armature shaft 21 of a motor M to a pulley 22 fast upon the shaft 18.

On opposite end of the pulley shaft 13 is a pinion 1 meshed with a pinion 2 upon a stub-shaft 23 and which drives a gear 3 upon a shaft 24 having at its other end a gear 25 meshing with a gear 26 upon a shaft 27 mounted in bearings 28 upon the superstructure 29 of the frame.

Upon the shaft 27 are fixed cutter disks 30 separated at desired intervals by cylindrical blocks 31 and 32, adjustable readily by substituting different sized blocks, the cutter disks being actuated rotatively when the shaft 27 is turned rotatively by the motor M through the medium of the belts, gears and pulleys above described.

A cooperating cylinder 34 with grooves 33 whose walls act as shearing surfaces, is carried upon a shaft 35 on which is fixed the gear 25 driven by the gear 26 already mentioned, so that the upper and lower cutter elements 30, 33, are disposed suitably to operate upon the wide band or web B, which is fed thereto over a guide roll 36 from a supply S of dough in web form which may desirably take the form of a roll thereof upon a shaft 37 rotatable in brackets 38 carried by the superstructure. Other means for feeding a suitable band of dough may be utilized as found convenient.

In pursuance of a stated object of the invention, the web B of plastic dough is subjected, as it is fed, to a treatment designed to harden its upper and lower surfaces in order to form thereon a crust of a nature calculated to facilitate its further treatment in the fabrication of macaroni or like parts.

As a convenient means for effecting such a hardening treatment, provision is made, in the instance illustrated, of a current of air supplied by a blower E mounted upon a bracket 39 extending from the frame upright 11.

The cooperating cutting elements 30, 33, act to sever the broad band or web B longitudinally at several regions as it is fed therebetween by the frictional action of the cylindrical parts 31, 32, and 34, which produce, in the instance illustrated, five relatively narrow strips of dough, designated generally by the reference character

D (see Fig. 3), and suitable for use in the fabrication of the final product, such as macaroni or the like, these useful strips being individualized in accordance with the invention by spaces which correspond in width with the width of the cylindrical spacing blocks 32 between adjacent cutters of the series 30.

In the instance illustrated there are four such intermediate strips, all designated by the reference character 40, and, as shown most clearly in Fig. 5, provision is made of means by which these strips 40 are respectively diverted from the common plane of the useful strips by means of stripper devices 41 which may desirably form part of a substantially continuous bar extending transversely across the machine adjacent to the bite of the rolls 31, 34, at the delivery side thereof.

It will be found that when thus diverted, the waste strips 40 will cling to the periphery of the cylindrical blocks 31, and accordingly auxiliary stripper means are desirably provided, taking the form, in the instance illustrated, of a knife or of a series of knives 42 secured by cap-screws 43 to a bridge piece 44 mounted upon a bracket 45 carried by the superstructure of the frame. One or more set-screws 46 may preferably be provided to regulate the position of the blocks 31 and 32, together with the intervening knives 30, relatively to the underlying blocks 34, so that this means of regulation may be utilized to determine the thickness of the strips D as well as to accomplish desired adjustments of the cutters.

As a feature of the invention, provision is made of means to accumulate the waste product W constituted by the free ends of the strips 40, and in the instance illustrated a wastebox or receptacle WB receives and accumulates the waste separately from the final product for such utilization of the waste as may be desired.

In pursuance of the primary object of this invention, which is to provide for a large output of macaroni and like articles by operating concurrently upon a series of individualized strips divided longitudinally from a relatively broad supply band or web of dough, the invention comprises the provision of a series of forming devices 47 mounted upon the shaft 13 and each having desirably three arms 48 each curved generally in the shape of the letter C, with their convex surfaces disposed in the direction of rotation, as shown clearly in Fig. 4. While three such arms are desirably provided upon each of the forming devices, it is not intended by such illustrative embodiment of the invention to exclude the use of more than three forming arms, or of less than three.

It is intended, however, that each of the three arms 48 shall be so constructed and arranged as to accomplish the entire formation of one macaroni part during each rotation of the forming device, so that three such parts are thus formed by one complete rotation of each three-armed forming device, and fifteen parts are formed in the course of each complete rotation of the shaft 13, which is desirably run at a fairly high speed, say, about 100 R. P. M. or more.

The strips of dough D are advanced continuously by means of the rolls 31, 34, and as the extremity of each forming arm is carried past the leading end 50 of a dough strip, it severs a portion of dough of suitable length to be formed into a macaroni part of the desired size and shape. In order to provide for a clean-cut severance of each said part, a shear or edge member 49 is provided in position to cooperate with the three arms of each such forming device, so that there will be preferably five such shear edges 49, each capable of suitable adjustment.

For this purpose a cap-screw 51 holds each said shear edge 49 at the end of a curve 52, the inner face 53 of this curve being preferably provided with a roughened or knurled or corrugated surface 54 which serves the double purpose of acting to retard rotation of the individual parts of dough 55, causing formative curling rotation thereof, and acts to impart to their exterior a desirably ribbed or knurled or corrugated surface.

The progressive formation of each such dough part, including the ribbed exterior, is clearly shown in Fig. 4 of the drawings, the final approximate shape being illustrated in cross section at 56; although it is to be understood that after complete drying the "Cavatelli" are usually somewhat more closed in cross-sectional shape than shown, but not to an extent which prevents access of water to their interior when being cooked, and of sauce thereto when they are served.

It is to be observed that the leading end 50 of each strip D is stripped from the roll 31 by means of a stripper knife 57, and at the same time receives suitable support from a part 58 of a bar across which it is fed past the knife edge 49 into one of the cavities 60 between adjacent former arms 48. These cavities, it will be noted, are each of approximately 120° in extent.

From the foregoing disclosure it will be apparent that the instant invention provides, in a compact machine, means for producing macaroni and like products in quantities comparable with the output of the conventional hydraulic type of dough-press employing multiple die orifices. The expense of maintenance and operation of a machine embodying the instant invention is relatively low by reason of its small power consumption and the absence therefrom of such wear as is incidental to die-press machines.

While in the present instance the invention has been described and illustrated as providing five strips of dough to be fabricated, it is apparent that machines utilizing a greater or lesser number of strips may be provided, dependent only upon the output desired.

It is to be understood that by suitable changes in the size and character of the cooperating forming devices, and of the spacing means, parts of different sizes and shapes may be produced without departing from the basic idea of means which underlies this invention.

What is claimed is:

1. In a device of the class described, means for feeding a supply of dough in a preformed relatively broad strip or web, means to divide said web into a plurality of individualized strip portions, a series of devices each adapted to fabricate individual tubular macaroni parts from said individualized strip portions, means to deliver said strip portions concurrently into the range of action of said fabricating devices, and mechanism constructed and arranged to actuate said strip dividing means, said fabricating devices and said delivery means in timed relation.

2. A device as claimed in claim 1, in which means are provided for severing said strip portions into relatively short strip lengths upon their delivery to said fabricating devices.

3. A device as claimed in claim 1, in which the respective fabricating devices are arranged in staggered relation whereby each fabricated

macaroni part may, during fabrication, expand along its major axis free from adhesive contact with other parts of the material undergoing fabrication.

4. In a machine for use in the fabrication of macaroni, a support for a supply web of dough wound in a supply roll, means to sever said web into a plurality of longitudinal useful strips and waste strips, means to fabricate individualized macaroni and like elements concurrently from the several strips, means to feed said web from said supply roll to said severing means, and diverting means comprising a bar extending transversely of the path of said divided strips of dough adjacent to the bite of the severing rolls at the delivery side thereof, said bar being constructed and arranged to divert said waste strips from the path of said useful strips.

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