

Sept. 15, 1925.

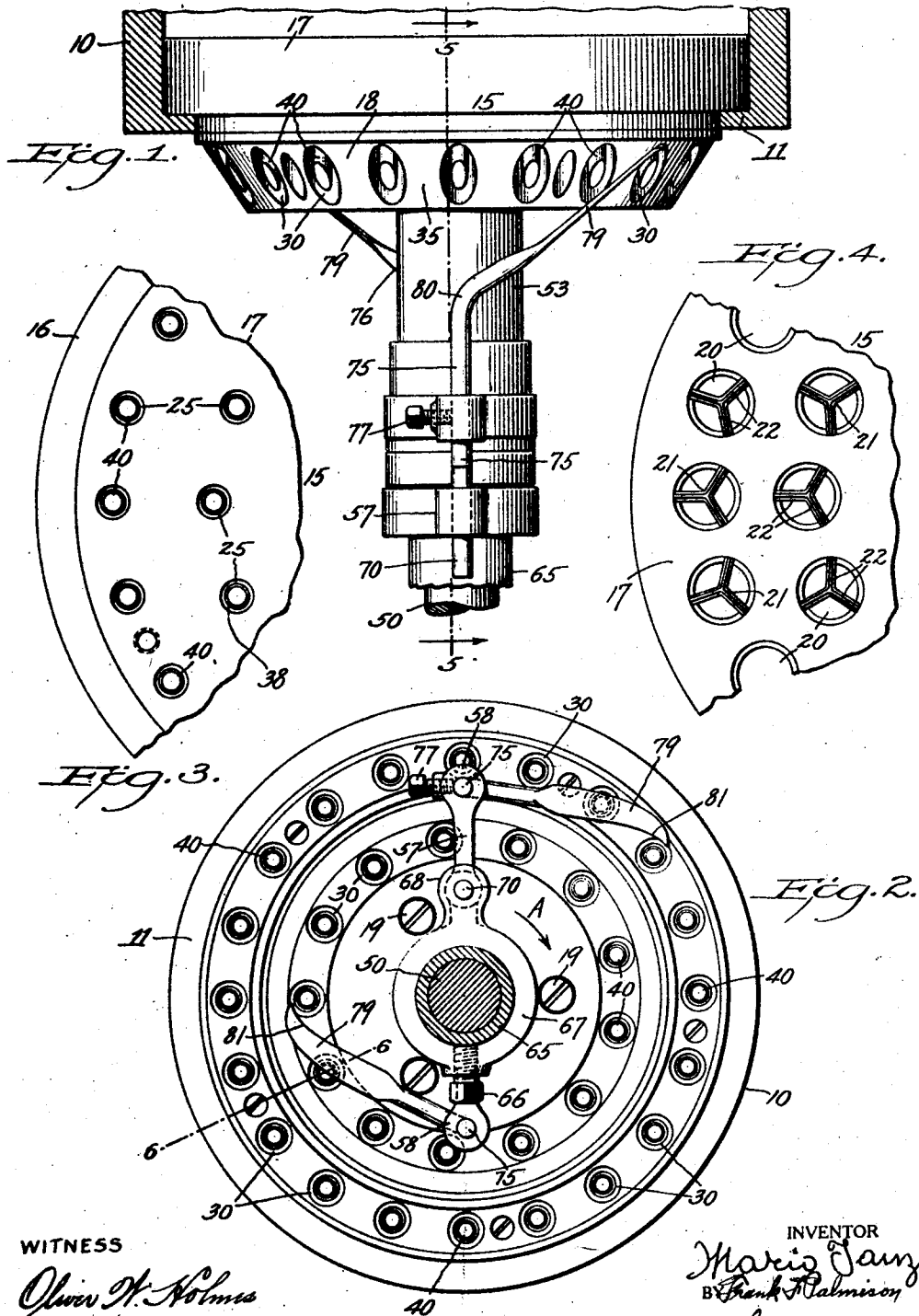
1,553,573

M. TANZI

DIE AND CUTTER

Filed Oct. 17, 1924

2 Sheets-Sheet 1



WITNESS

Oliver H. Holmes

INVENTOR

Mario Tanzi
BY *Frank H. Palmison*
his ATTORNEY

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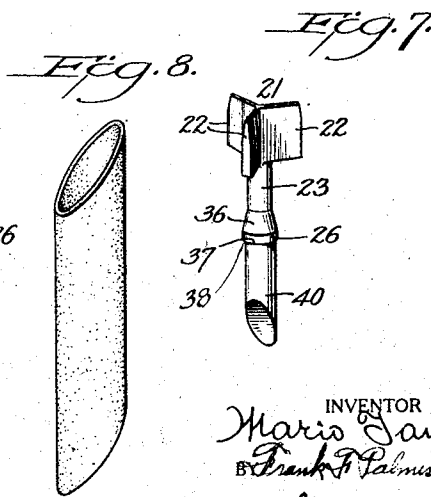
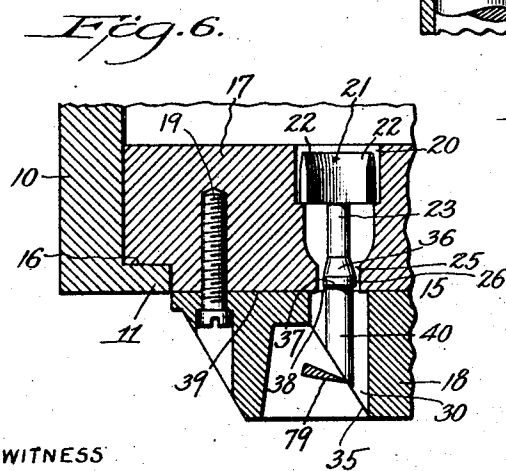
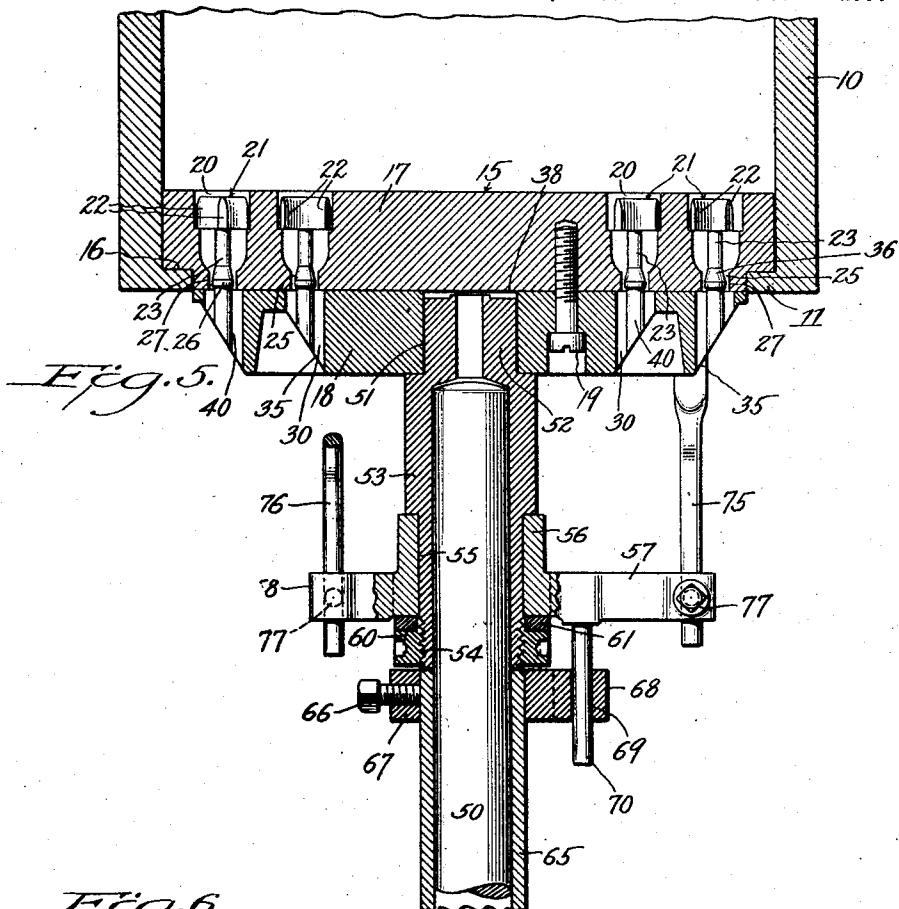
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UNITED STATES PATENT OFFICE.

MARIO TANZI, OF BROOKLYN, NEW YORK.

DIE AND CUTTER.

Application filed October 17, 1924. Serial No. 744,185.

To all whom it may concern:

Be it known that I, MARIO TANZI, a subject of the King of Italy, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented an Improvement in Dies and Cutters, of which the following is a specification.

This invention relates to dies for manufacturing tubular products and more particularly dies which co-operate with cutters for cutting the tubular products in predetermined lengths.

It is an object of the invention to provide a labor saving construction for cutting on diagonal lines tubular products such as macaroni, as the same emerge out of the press.

It is another object of the invention to provide a simple but effective construction for producing in one operation tubular products cut on diagonal lines.

It is a further object of the invention to provide a macaroni die and cutter, which is simple in construction durable and adaptable to be used in connection with the ordinary macaroni press, and which permits the macaroni as it is molded to be cut on diagonal lines as they are formed and come out of the die, without further manipulation or additional machines.

Other and further objects of the invention, together with its advantages and distinguishing features, will appear as the specification proceeds, which specification is descriptive of one embodiment of the invention as illustrated in the accompanying drawings, forming a part of the specification. It is understood that the said drawings only illustrate one example of my invention, that the specification is only descriptive of such an example as illustrated, and that I do not limit myself to the exact features illustrated, for it is manifest that the same can be easily altered, varied, and changed without in the least departing from the spirit of my invention.

Referring to said drawings:

Figure 1 shows a side elevation of the aforesaid embodiment as attached to the cylinder of a macaroni press;

Figure 2 is a plan view of the aforesaid embodiment looking upwardly to the illustration shown in Figure 1;

Figure 3 is a view of a broken-off portion of the base die hereafter to be described and showing the outer face thereof;

Figure 4 is a view of a broken-off portion of the base die showing the inner face thereof;

Figure 5 is a sectional view taken on line 5—5 Figure 1;

Figure 6 is a cross sectional view of a portion of the die taken on line 6—6 in Figure 2;

Figure 7 is a side view of the pin which co-operates with the die in the formation of the tubular article, and hereinafter more fully described; and

Figure 8 is a side view of the molded and cut article produced by the die forming the subject matter of this invention.

The article which is produced by this device is known in the macaroni industry as "maltagliato", and is rather a demanded article, for it has, aside from its quaint appearance, certain other characteristics better known in the macaroni industry, which add to the tenacity of the article after it is cooked.

Referring again to the aforesaid illustration 10 represents the lower end of the cylinder of a macaroni press, which may be conveniently formed with a flange 11 extending inwardly and substantially at right angles to the walls of the cylinder. On this flange 11 is accommodated, or set, the die 15 which is formed, as more clearly shown in Figure 5, with a shoulder 16. The construction heretofore described is old in the art, and no claim of novelty is made thereto.

The die 15 comprises a base die 17 and a cap member 18, the cap member 18 being secured to the base die 17 by means of bolts 19 passing through aligned holes in the cap member and in the base die. The base die 17 is formed with a series of concentrically arranged holes 20 in which are arranged the cores 21, formed with prongs 22, through medium of which they are held in the holes, and with the shanks 23. The holes 20 are contracted, or made smaller in diameter, at 25 where the collar 26, on the shank 23 is located. The paste which is pressed downwardly in the cylinder is forced between the collar 26 and the walls 27 at the restricted portion 25 and it emerges from the holes 20 in a tubular form.

The cap member 18 is formed with circularly arranged holes 30 which are aligned with the holes 20 in the base die, and

through which extend the shanks 23 of the cores 21. This cap member 18 is formed with a plurality of concentrically arranged inclined faces 35, to which extend the holes 5 30. There being as many inclined faces as there are series of concentric holes 30. In the illustrated example there appearing only 2 inclined faces, for there are 2 series of holes 20 and 30.

10 The collar 26, as it will be noted from the illustration in Figure 5 and in Figure 6, has a tapered portion 36 and a straight portion 37. The width of the straight portion 37 is substantially shorter than the 15 length of the walls 27 of the contracted portion of the hole 20. By actual tests and experiments it has been found, that unless the lower edge 38 of the straight portion 37 extends to a distance shorter than the plane 20 of the inner face 39 of the base die 17, the molded paste emerging from the hole 20 will clog and spoil the smoothness of the faces thereof. Special stress is laid on this point, and I find it advisable to have the 25 lower edge 38 in a plane removed about $\frac{1}{16}$ to $\frac{1}{8}$ of an inch away from the plane of the inner face 39. Below the collar 26 extends a pin 40, constituting an extension of the core 21, the lower end of which is cut on 30 diagonal lines to correspond to the plane of the inclined faces 35, and with which plane the said end coincides. The tubular paste is guided, as it emerges from the restricted portion of the hole 20, and kept in a straight 35 course by the pin 40, and thus prevented from bulging or warping.

From the heretofore description it is seen that the die of this invention comprises substantially a base die 17 and a cap member 40 18, the two being held together by means of the bolts 19, and both being formed with aligned holes, through which extend the plugs 21, with the shanks extending to a plane coinciding with the inclined faces 35 of the 45 cap member 18. It is understood that these two members 17 and 18 could be manufactured in one piece, and with any number of inclined faces 35, and any number of holes 20 and 30. The die is made in two pieces 50 in order to simplify its construction.

In order to effect the cutting of the molded tubular paste the hereinafter described device is resorted to. Before describing this 55 device it is necessary to briefly state that there are now in use macaroni presses that have revolving knives for cutting the molded tubular paste at right angles to its axis as it comes out of the die. Such devices 60 generally comprise a shaft 50, which by means of gears or pulleys is made to revolve below the cylinder of the press with its axis substantially in line with that of the cylinder. To this shaft is connected or coupled a knife which revolves with the shaft 65 and which cuts at the outer face of the die

the material molded as it emerges. An object of this invention is that of employing as far as possible the standard equipment now in existence, and for that reason the herein-after described apparatus is employed in 70 connection with the said shaft 50.

The cap member 18 is provided with a central hole 51 in which is made to fit the end 52 of a sleeve 53. This sleeve 53 is conveniently contracted at 55 and threaded at 75 54. The contracted portion 55 is surrounded by a revolving sleeve 56 and is held in its place by means of a threaded ring 60 which cooperates with the threads on sleeve 53. In order to eliminate as much friction 80 as possible, and also in order to prevent looseness of the sleeve 56, I interpose between the revolving sleeve 56 and the threaded ring 60 a bearing ring 61, which may be conveniently made of metal or of 85 some other substance better fitted for the purpose used. The remaining portion of the shaft 50 is enveloped by a tube 65 which is provided at its lower end with a gear or 90 a pulley for receiving its rotation movement. In this case the shaft is held stationary and the tube 65 is made to rotate about the shaft. However, the shaft may be made to rotate if necessary. The means that rotate 95 the sleeve 65 are not shown, for they do not form a part of this invention.

On the sleeve 65 I clamp, by means of a bolt 66 a clutch ring 67 which is preferably provided with an arm 68 having a hole 69. 100 The arm 57 of the revolving sleeve 56 is provided with a clutch pin 70 which is either made to bear against one of the faces of the arm 68, or inserted in the hole 69. From this connection it is seen that the revolving 105 movement of the tube 65 is transferred to the sleeve 56 which rotates on the sleeve 53, the sleeve 53 and the shaft 50 being held stationary, and employed as supporting members for the revolving sleeve 56 and the 110 tube 65.

The arms 57 and 58 are provided with openings adjacent their outer ends in which are inserted the shanks of the knives or cutters 75 and 76. The said shanks are firmly held in place by means of bolts 77, each of 115 which is threaded in a hole in the arms 57 and 58 respectively, substantially at right angles to the axes of the shanks 75 and 76 and against which they bear when tightened. In the illustrated example the knife at the 120 end of the shank 75 co-operates with the outer inclined face 35 of the cap member 18 and the knife at the end of shank 76 co-operates with the inner inclined face 35 of the said cap member. In case there are 125 more inclined faces than the number shown in the illustrated example then the sleeve 56 is provided with as many arms as there are inclined faces, each arm carrying a knife.

Reference is now had more specifically to 130

Figure 3 wherein the knives or cutters 78 and 79 are illustrated as they appear looking toward the die. It will be noted that the blades of the cutters are disposed in a position in advance or forward of the axes of the shanks 75 and 76. This is done so as to effect the cutting of the molded article as it emerges from the die in a plane forward of the axes of the shanks 75 and 76, for otherwise the point 80, for instance, of the shank 75 would interfere with the molded article before it was cut, if the knife was not arranged as described. The rotation of the knives is in the direction shown by the arrow A. The knives or cutters are curved adjacent their outer ends 81 so as to begin the cutting of the article from a point slightly rearward of a line drawn between the center of the die and the center of the pin 40. This is done so as to prevent a crushing of the ends of the article to be cut, and to prevent any roughness that would take place at the lower portion of the cut end of the article produced.

The cutters in revolving about the inclined faces 35 of the die, cut the molded article as it comes out of the die, in lengths determined by the speed with which the article comes out of the die, and the speed of the knives or cutters about the inclined faces. By changing either the speed of the knives or cutters, or the speed of the molded article in coming out of the die, the lengths of the "maltagliato" are varied.

This device will therefore eliminate the necessity of a cutting machine or of transferring from the press the molded article to such cutting machine. All that is necessary is a tray below the die and the cutter in which drops the article as it is severed from the die.

I would state in conclusion that while the illustrated and described examples constitute a practical embodiment of my inventions I do not limit myself strictly to the exact details herein illustrated, since, manifested, the same can be considerably varied without departure from the spirit of the invention, as defined in the appended claims:

What I claim as my invention is:

1. In combination, a die for shaping pastes, said die being formed with a groove and with a plurality of spaced apertures leading to said groove, and a cutter moving within said groove and over said apertures.

2. In combination, a die for molding pastes formed with a groove, one of the walls of said groove being inclined, and a cutter moving over said inclined wall.

3. In combination, a die for shaping pastes, said die being formed with a plurality of concentrically arranged inclined faces, the outer edge of each inclined face terminating in a plane substantially the

same as that of the outer edge of the other inclined face, said die being also formed with a series of openings spaced from each other and leading to the inclined faces, and a cutter moving over each of said inclined faces.

4. In combination, a die for molding pastes, said die being formed with a circular ridge presenting at one of its sides an inclined face, said die being also formed with a groove, one wall of which is also inclined, means for molding said paste in tubular form extending to said inclined faces, and a cutter moving over said inclined faces to cut said molded tubular articles in equal predetermined lengths.

5. In combination, a die for molding pastes, said die being formed with a plurality of circular inclined faces, each face having its outer edge terminating in a plane substantially the same as the outer edge of the other face, said die being also formed with a plurality of spaced openings leading to said inclined faces, means within said openings for molding said paste in tubular form, and a cutter moving over the said inclined faces to cut said molded tubular articles in predetermined lengths, each of said means having a shank extending to the plane of the inclined face with which it operates.

6. In combination, a die for molding pastes, having concentrically arranged inclined faces, and formed with a plurality of spaced openings leading to said inclined faces, means within said openings for molding said paste in tubular form, said means having a collar between its ends, and a cutter moving over each of said inclined faces to cut said molded tubular articles in equal predetermined lengths.

7. In combination, a die for molding pastes, having concentrically arranged inclined faces, and formed with a plurality of spaced openings leading to said inclined faces, means within said openings for molding said paste in tubular form, said means having its outer end cut at an angle to its axis to conform to the plane of said inclined faces, and cutters moving over said inclined faces to cut said molded tubular articles in equal predetermined lengths.

8. In combination, a die for molding pastes, having concentrically arranged inclined faces, and formed with a plurality of spaced openings leading to said inclined faces, means within said openings for molding said paste in tubular form, said means having a collar with a portion thereof tapered inwardly and its outer end cut on diagonal lines to conform to the plane of said inclined faces, and a cutter moving over each of said inclined faces to cut said molded tubular articles in equal predetermined lengths.

9. In combination, a base die formed with through-holes, and a cap member secured to the base die formed with concentrically arranged inclined faces, and with holes
5 alined with the holes in the base die and extending to the inclined faces.

10. In combination, a base die formed with a series of holes arranged in concentric rows, a cap member formed with concentric inclined faces and holes alined with
10 the holes in the base die, and a core in each hole with its lower end extending to the plane of the inclined faces.

11. In combination, a base die formed
15 with a series of holes arranged in circles, a cap member formed with concentric inclined faces and holes alined with the holes in the base die, a core having one end held in the hole in the base die and the other
20 end free in the hole in cap member, with the latter end cut so as to be in a plane substantially in line with the plane of the inclined face to which it extends.

12. In combination, a base die formed
25 with a series of holes arranged in circles, a cap member formed with concentric inclined faces and holes alined with the holes in the base die, and a core formed with a collar between its ends arranged in each
30 hole, the outer end of said plug being cut on diagonal lines so as to coincide with the inclined faces of the cap member.

13. A device of the character stated comprising a die for molding pastes having a
35 circularly arranged inclined face, and a plurality of holes extending from the opposite face of the die to the inclined face, each of said holes having a restricted portion between its ends, a core formed with a collar
40 arranged in each hole, said collar having a tapered portion and being arranged in the restricted portion of the hole with its lower edge extending to a plane removed from the
45 plane of the lower end of the restricted portion of said hole, and means revolving about the axis of said die and carrying a cutter co-operating with said inclined face.

14. A device of the character stated comprising a die for molding pastes having a
50 circularly arranged inclined face, and a plurality of holes extending from one face of the die to the inclined face, each of said holes having a restricted portion between its ends, a core formed with a collar arranged in each hole, said collar having a
55 tapered portion and being arranged in the restricted portion of the hole with its lower edge extending to a plane removed from the plane of the lower end of the restricted portion of said hole, and means holding a cutter
60 to co-operate with said inclined face, together with means for revolving said cutter about the axis of said die.

15. In a device of the character described,
65 a die for molding and cutting pastes com-

prising a member formed with a plurality of concentrically arranged inclined faces, said member being provided with a plurality of molding elements, each element merging
70 into one of said circularly arranged inclined faces, a cutter moving over each of said inclined faces, and means holding said cutters and revolving the same about the axis of said die.

16. In a device of the character described,
75 a die for molding and cutting pastes comprising a member provided with a plurality of molding elements, each element merging into a circularly arranged inclined face, a
80 cutter moving over said inclined face, and means holding said cutter and revolving the same about the axis of said die, said means comprising a shaft, a sleeve revolving about
85 said shaft, and an arm element on the sleeve to engage said cutter.

17. In a device of the character described, a die for molding pastes formed with concentrically inclined faces, a shaft, a sleeve
90 enveloping one end of said shaft for securing the same to the die, a revolving sleeve surrounding a portion of said first mentioned sleeve and formed with an arm, cutters carried by said arm, said cutters co-operating with said inclined faces, an engaging
95 element also carried by said arm, revolving means surrounding said shaft and engageable with said engaging element for rotating said revolving sleeve.

18. In a device of the character described,
100 a die for molding pastes formed with concentrically inclined faces, a shaft, a sleeve enveloping one end of said shaft for securing the same to the die, a revolving sleeve surrounding a portion of said first mentioned
105 sleeve and formed with an arm, cutters carried by said arm, said cutters co-operating with said inclined faces, an engaging element also carried by said arm, revolving means surrounding said shaft and
110 engageable with said engaging element for rotating said revolving sleeve, together with a friction ring coacting with the revolving sleeve.

19. In combination with a die for molding tubular articles, said die being formed
115 with a circular groove, a cutter revolving about the axis of the die for cutting said tubular articles on lines diagonal to the vertical axis of the tubular article, said cutter
120 operating in said groove.

20. In combination, a die for molding tubular articles, said die being formed with a plurality of inclined faces concentrically
125 arranged and a cutter moving over each of said inclined faces.

In testimony whereof, I have signed my name to this specification this 14th day of Oct., 1924.

MARIO TANZI.