April 8, 1958 F. J. ROUAN 2,829,591

POSTAGE PRINTING DIE PROTECTION

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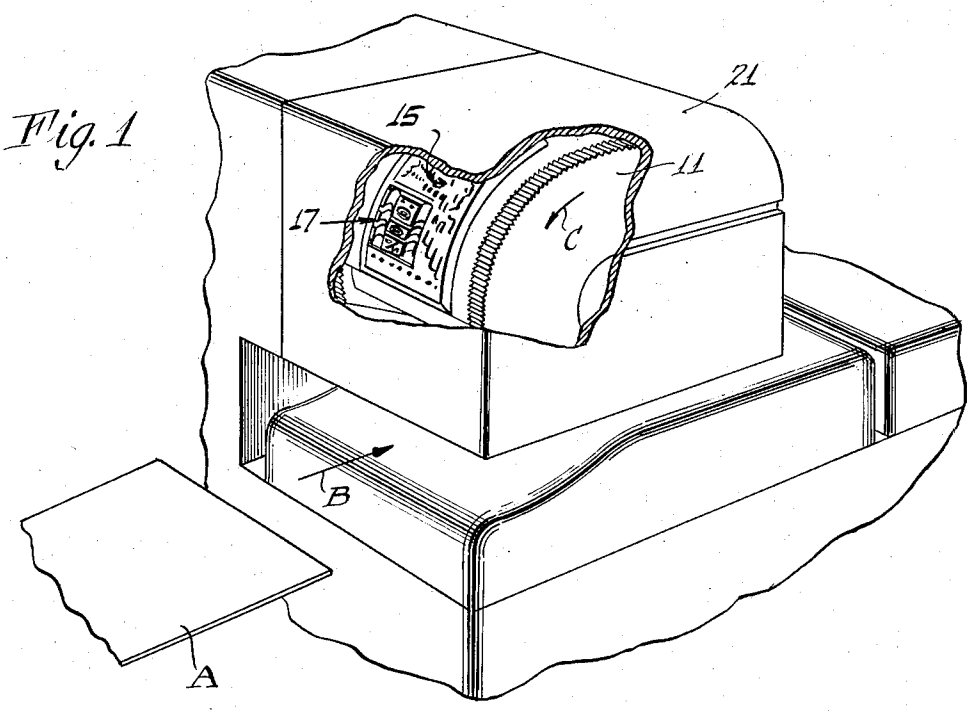
Fig. 1



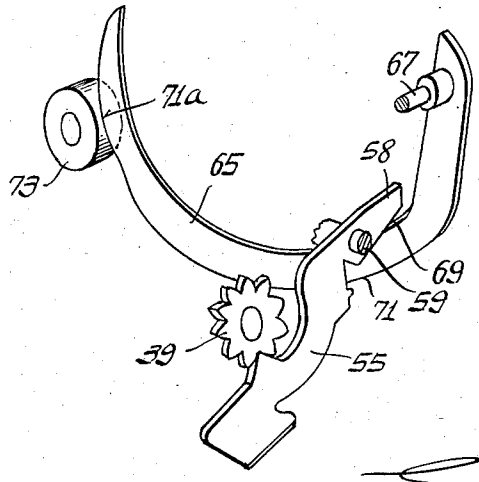


Fig. 7

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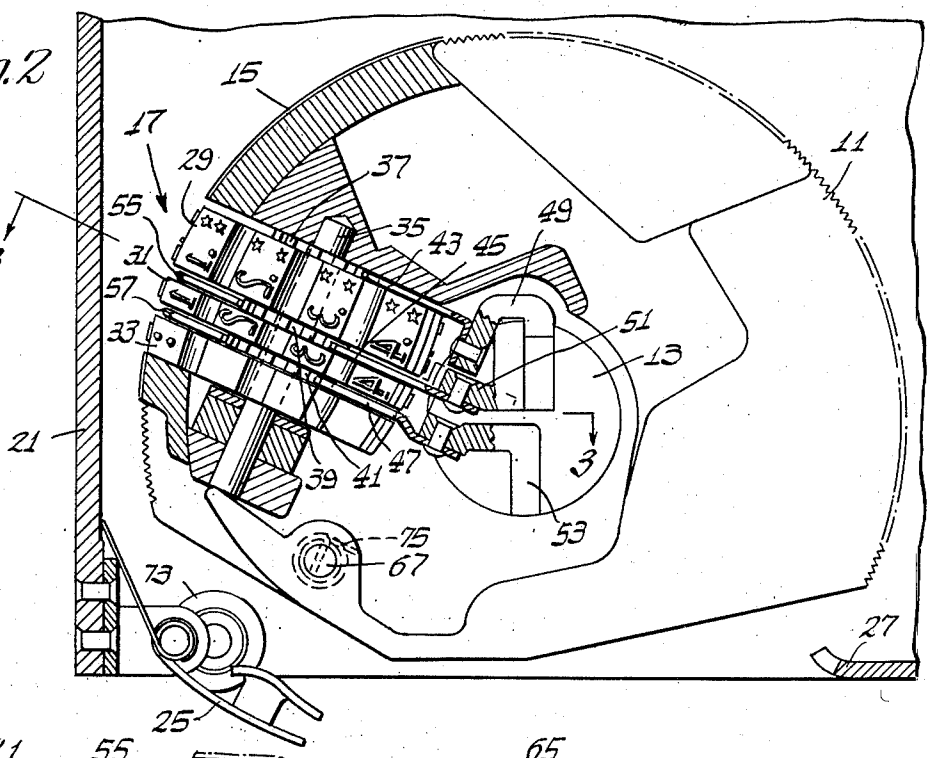
Fig. 2



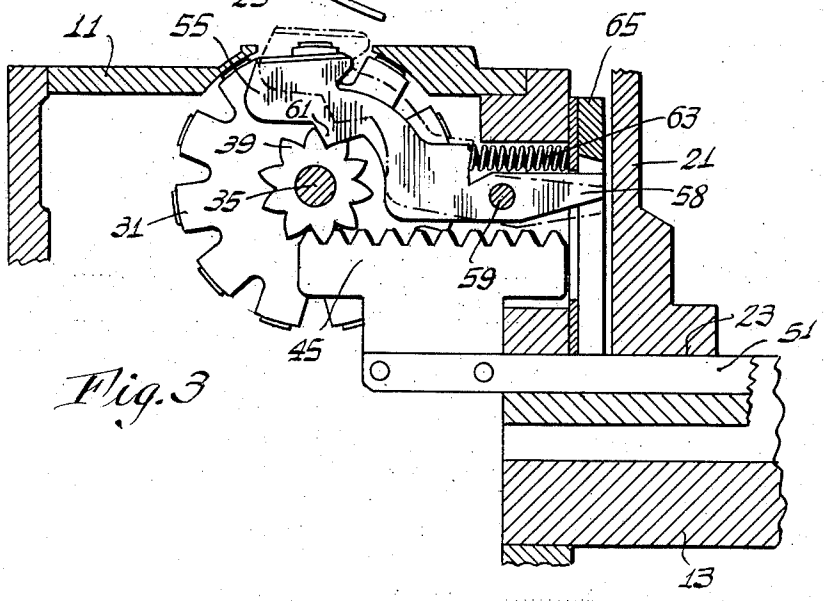


Fig. 3

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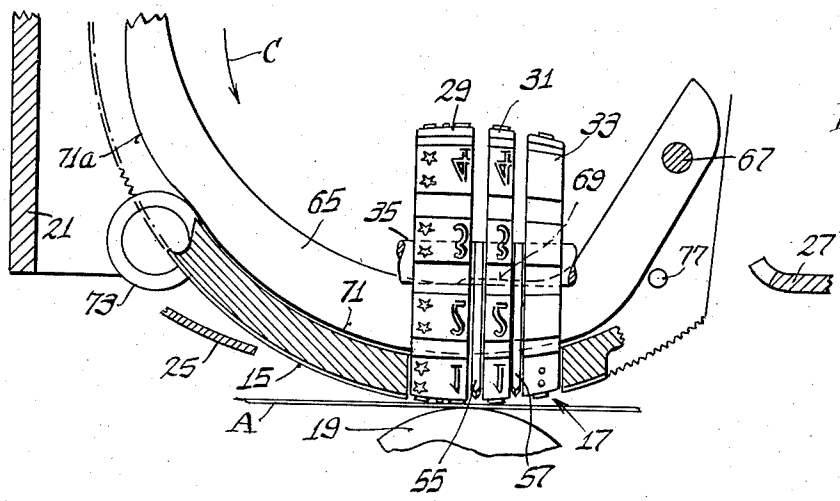

Fig. 4

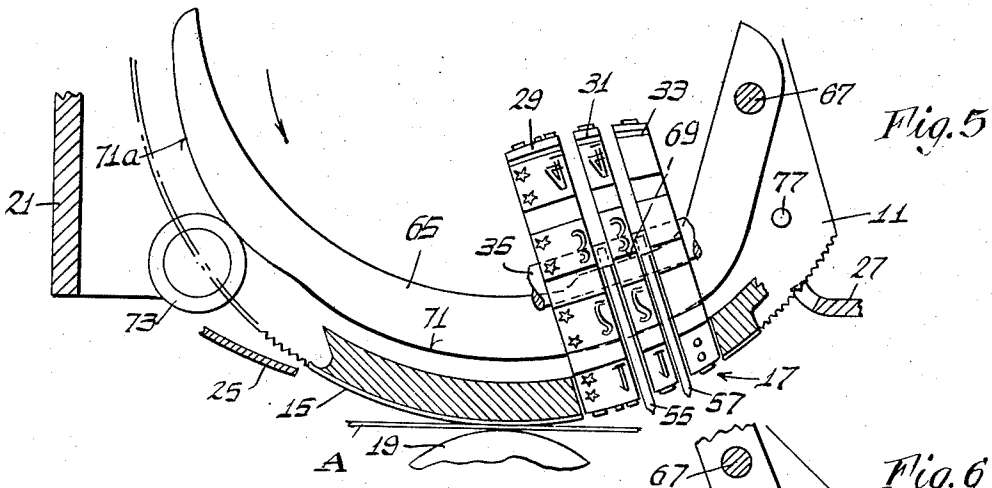

Fig. 5

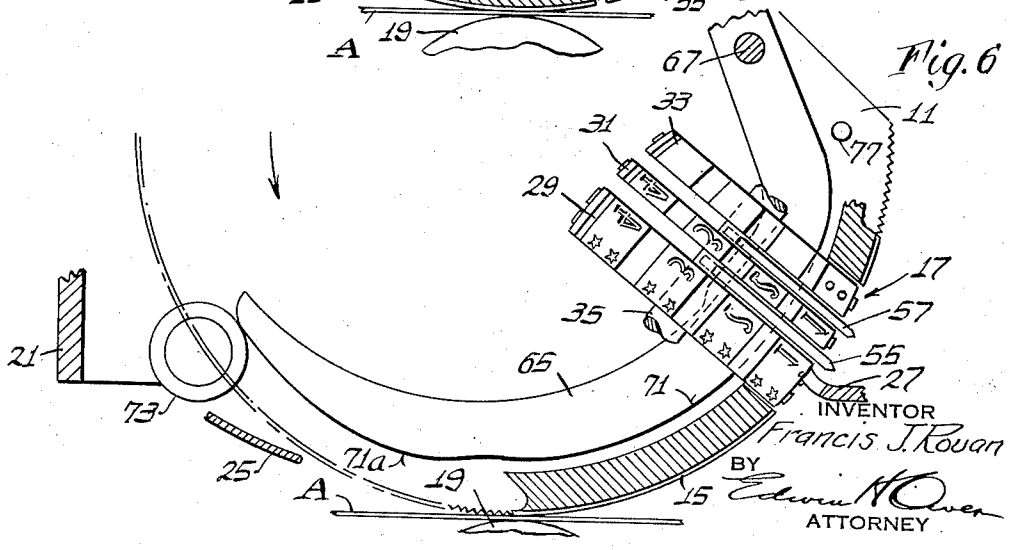

Fig. 6

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2,829,591

POSTAGE PRINTING DIE PROTECTION

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Application May 10, 1956, Serial No. 584,090

7 Claims. (Cl. 101—91)

This invention relates to printing die protection, in association with postage or other value printing, and is primarily concerned with the prevention of the taking of unauthorized or fraudulent impressions from the printing die.

In a rotary postage printing device, postage impressions are adapted to be printed on letters or tape passed between a printing element and a platen roller, and inasmuch as each impression is of predetermined value, the said value is registered within suitable registering mechanism. It is important therefore to prevent taking more than the one legitimate impression from the printing die surface at the printing position during a printing cycle of operation.

There have been various means suggested for the protection of printing dies which are well adapted for the purpose. However, as the development of postage meters has progressed, efforts have been directed towards reduction in size of all parts including the printing assembly. Reduction in size of the latter, however, has met some resistance by reason of the necessity for the presence of the die protection means and the nature of their operation as heretofore constructed. According to the present invention it has been discovered that by arranging a projectable die protection device within the value printing area it is possible to effect substantial space economies with equal protection effectiveness, which is the primary object of this invention.

Another object of the present invention is the arrangement of projectable printing die protection means in a position intermediate the value printing wheels of a settable value printing mechanism.

Another object of the invention is the provision in a rotary printing device of novel simplified mechanism for controlling the positioning of a projectable die protection means.

Still another object of the invention is the provision in connection with a settable value printing die wheel of a die protection means having projectable elements serving also as detent means for determining the position of a value printing wheel.

In the drawings a preferred form of the invention is shown wherein:

Figure 1 is a fragmentary perspective view of a postage printer having a printing head according to the invention, with a portion of the casing broken away to show the printing die in home position.

Fig. 2 is a transaxial section through the printing drum and housing of Fig. 1.

Fig. 3 is a detail section substantially on line 3—3 of Fig. 2.

Figs. 4, 5 and 6 are fragmentary detail sections similar to Fig. 2 but with most of the printing drum shown in phantom for purposes of clarity, and showing the parts in successive positions during a printing cycle.

Fig. 7 is a detail perspective view showing a die protection element and the moving means therefor.

Referring to the drawings in detail a printing member

or drum **11** is mounted on a shaft **13** which may be cyclically driven in one direction as indicated by arrows C in any suitable manner, and is always prevented from rotation in the opposite direction. On the surface of the printing drum is a postage printing die **15** which includes a value printing portion **17**.

Beneath the printing drum for cooperation with the printing dies thereon is an impression roller **19**.

A casing **21** envelops the front, back and top of the printing drum, the bottom portion being left open so that printing on passing tape, envelopes or other articles can be effected. The shaft **13** passes through an opening **23** in the back of the casing **21** for supporting and rotating the drum **11** within the casing. A pivoted die guard element **25** at the approach side of the opening **23** and a lip **27** at the retreat side serve to close off the bottom of the casing as much as practical to provide minimum access to the printing die while it is in the lower or printing position.

The value printing portion **17** of the postage printing die **15** is made up of settable type wheels **29**, **31** and **33** rotatable on a common shaft **35** mounted in the printing drum **11**. The type wheels have attached thereto driving gears, i. e. gears **37**, **39** and **41** respectively. The gears **37**, **39** and **41** are driven by racks **43**, **45** and **47** respectively connected to slide bars **49**, **51** and **53** respectively mounted slidably in suitable longitudinal grooves in the shaft **13**. The type wheels **29**, **31** and **33** are so mounted that the portion of their peripheries which are in printing position are flush with the surface of the rest of printing die **15**. By operating the slide bars **49**, **51** and **53** in a known manner, the wheels **29**, **31** and **33** can be set for any desired value to be printed, and the postage meter mechanism is arranged, as is known in the prior art, in a manner to register the amount printed at each printing operation.

It can be seen that the drive gears and racks compel the presence of narrow spaces between the type wheels. These spaces, already required by the wheel setting elements, are taken advantage of according to the present invention as space to receive die protection means for projection out from the face of the die at times during the cycle when it is desired that no impression be taken. In the form shown the die protection means includes thin leaf-like levers or blades **55** and **57** which are sandwiched between the type wheels and have actuating arms **58** projecting to one side of the type wheels where they are rockably mounted on a pin **59** affixed to the printing drum **11**. Each of the levers has a tooth **61** formed thereon like that seen in Fig. 3, arranged to engage between the teeth of the adjacent drive gear **39** or **41** to act as a detent thereagainst. The levers are urged into detent position by springs **63** one of which is seen in Fig. 3. When the levers **55** and **57** are in detent or solid line position as seen in Fig. 3, their protecting portions are disposed between the type wheels and below the printing surfaces thereof so as to be out of operative position. A pressure radially inwardly of the drum **11** exerted on the actuating arms **58**, however, will oppose the force of springs **63** and cause the protective portions of the levers **55** and **57** to be projected from between the type wheels into operative position as shown in broken lines in Fig. 3. The expression "below the printing surface" is selected herein to indicate a withdrawn position of the protecting means where it fails to interfere with the printing operation, and is used as a convenience to describe this relationship regardless of the particular horizontal or vertical relationships which may be involved in any particular situation.

An operating lever **65** is carried by one face of the printing drum **11** and is pivoted thereon by a pin **67**. The lever **65** has a contact portion **69** adjacent and outwardly

of the operating end portions 58 of the die protection levers 55 and 57, and an outer cam edge 71 disposed to encounter and move along a roller 73 mounted on a fixed axis in the housing 21 as the printing drum rotates. A slight rocking movement is imparted to the lever by the engagement of its cam edge 71 with the roller 73 during the period of their contact which represents about one-half rotation of the drum 11. A torsion spring 75 (Fig. 2) is arranged at the pivot location 67 and is disposed so as to urge the operating lever 65 outwardly against the roller 73 when in position to touch the same, or otherwise against a suitable stop 77 affixed to the surface of the drum 11.

In operation a letter, tape or other article identified by reference character A will be advanced in the direction indicated by arrow B in Fig. 1, the printing drum being in the home or Fig. 2 position. At the appropriate time the drive for drum 11 will be automatically tripped in a known manner to start drum rotation in the direction of arrows C, whereupon the drum 11 will make contact with the article A and start to feed it forward against the impression roller 19. As the leading edge of the printing die 15 moves down into contact with the article A the trailing end is still protected by guard 25 from unauthorized access. When the parts reach the Fig. 4 position, the value printing section 17 is making its impression. It can be seen that the lever 65 has made contact with the roller 73, but the cam edge 71 has a long leading concentric portion which produces no lever movement other than initial displacement from the stop 77. In Fig. 4 the parts are shown with the roller 73 at the end of said concentric portion with a slightly bulged portion 71*a* of the cam edge extending therebeyond.

As the printing continues (Fig. 5) the value portion 17 of the die 15 begins to be exposed beyond the impression roller 19 and substantially the whole die 15 is accessible between guard 25 and lip 27, rendering the die 15, except for the protective mechanism, in a sense susceptible to the taking of fraudulent impressions. However, at this position the protective mechanism comes into operation, for the bulged portion 71*a* of lever 65 is then in contact with roller 73 so that the lever 65 is moved inwardly against the force of its spring 75. The contact portion 69 engages the actuating arms 58 of die protection levers 55 and 57 causing the protective end portions thereof to be projected beyond the printing surface. Thus the only printing which can be performed is the continued progressive printing of the already initiated impression on article A, any attempt to take another complete or substantially complete impression at this drum position being defeated by the projecting protective portions of levers 55, 57. The bulged portion 71*a* of the cam edge of lever 65 is of sufficient length that the protecting portions of levers 55 and 57 will remain projected until the value printing portion 17 has progressed far enough to be fully guarded by the lip 27 (Fig. 6), at which point the lever 65 ends and drops off the roller 73 to be held against its stop 77 until the next revolution.

As seen in Figs. 3 and 7 the teeth 61 on levers 55 and 57 are urged by springs 63 into firm engagement between the teeth of gears 39 and 41 and serve to position the printing wheels 31 and 33 accurately in their selected position during printing, thus avoiding the inclusion of separate detent means. The wheel 29 may, of course, be held by detent means of the usual form (not shown), or an additional blade similar to the blades 55, 57 may be associated with it and with its gear 37 if desired.

While the foregoing description sets out specifically a rotary postage printer, it will be readily understood that certain aspects of the invention pertain with equal force to other types of printing such as reciprocatory printing, and that the subjoined claims are to be understood as including the latter except when so worded as to expressly exclude them.

What is claimed is:

1. In combination in a value printing device, a printing die including settable value printing wheels in spaced side-by-side relation; and protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die at the precise position of the value to be printed to prevent the taking of unauthorized impressions therefrom.

2. In combination in a value printing device, a printing member and an impression member having relative printing movement therebetween; a printing die on the printing member and including settable value printing wheels in spaced side-by-side relation; protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die at the precise position of the value to be printed to prevent the taking of unauthorized impressions therefrom and retractable below said surface to permit printing therefrom at appropriate times; and means responsive to said relative movement for automatically effecting the projection and retraction of said protective blade portion.

3. In combination in a value printing device, a printing member and an impression member having relative printing movement therebetween; a printing die on the printing member and including settable value printing wheels in spaced side-by-side relation; protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die to prevent the taking of unauthorized impressions therefrom and retractable below said surface to permit printing therefrom at appropriate times, and a portion extending to one side of said wheels constituting a mounting section and an actuating arm; means rockably mounting said blade on said printing member at said mounting section; and means responsive to said relative movement for moving said actuating arm to effect the projection and retraction of said protective blade portion.

4. In combination in a value printing device, a frame; a printing drum rotatable on the frame; a printing die on the drum including settable value printing wheels in spaced side-by-side relation; protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die to prevent the taking of unauthorized impressions therefrom and retractable below said surface to permit printing therefrom at appropriate times, and a portion extending to one side of said wheels constituting a mounting section and an actuating arm; means rockably mounting said blade on said drum at said mounting section; and means responsive to rotation of said drum on said frame for moving said actuating arm to effect projection and retraction of said protective blade portion.

5. In combination in a value printing device, a frame; a printing drum rotatable on the frame; a printing die on the drum including settable value printing wheels in spaced side-by-side relation; protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die to prevent the taking of unauthorized impressions therefrom and retractable below said surface to permit printing therefrom at appropriate times, and a portion extending to one side of said wheels constituting a mounting section and an actuating arm; means rockably mounting said blade on said drum at said mounting section; a lever rockable on said drum having a portion engaging said actuating arm and a peripherally directed cam surface; and a lever deflecting element on said frame in a position to engage said cam surface and rock said lever to compel projection of said protective blade portion during certain positions of said drum.

6. In combination in a value printing device, a frame; a printing drum rotatable on the frame; a housing enclosing said drum, but having an opening adjacent the printing position; a printing die on the drum including settable value printing wheels in spaced side-by-side relation; protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die at the precise position of the value to be printed to prevent the taking of unauthorized impressions therefrom and retractable below said surface to permit printing therefrom at appropriate times; and means responsive to rotation of said drum on said frame for automatically effecting projection of said protective blade portion while the printing die is traveling through a portion of its exposed rotation adjacent said housing opening.

7. In combination in a value printing device, a printing die including settable value printing wheels in spaced

side-by-side relation; a toothed wheel of smaller diameter than said wheels secured to one of said wheels and located between them; protection means for said die including a blade positioned between the printing wheels and having a portion projectable beyond the printing surface of the printing die to prevent the taking of unauthorized impressions therefrom and retractable below said surface to permit printing therefrom at appropriate times; a tooth on said blade engageable with the teeth of said toothed wheel when the blade is retracted; and spring means urging said blade towards retracted position.

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