

[54] **CUTTING PUNCHES FOR DESTROYING HYPODERMIC SYRINGES**

[76] Inventor: **Murry M. Robinson**, 1712 I St., N.W., Washington, D.C. 20006

[22] Filed: **May 9, 1972**

[21] Appl. No.: **251,695**

[52] U.S. Cl. **83/167, 83/580, 83/633, 83/648, 83/925 R**

[51] Int. Cl. **B23d 15/04**

[58] Field of Search **83/167, 580, 588, 83/590, 633, 648, 925 R, 622**

[56] **References Cited**

UNITED STATES PATENTS

2,768,560	10/1956	Hirson	83/588 X
1,084,533	1/1914	Calaway	83/588
3,404,593	10/1968	Arcaese et al.	83/925 R
3,469,750	9/1969	Vanderbeck	83/925 R

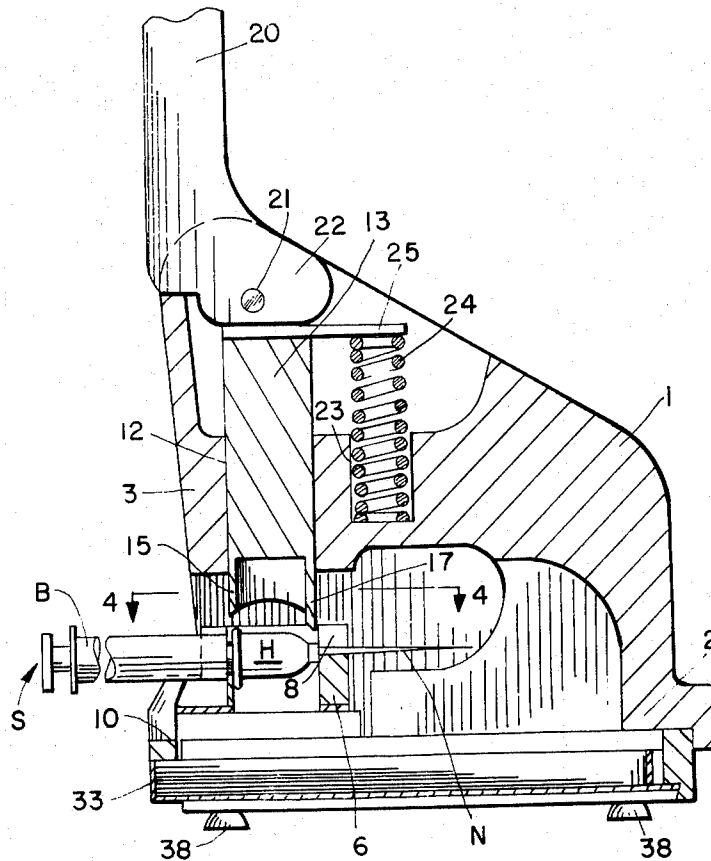
3,585,835 6/1971 Clement 83/925 R

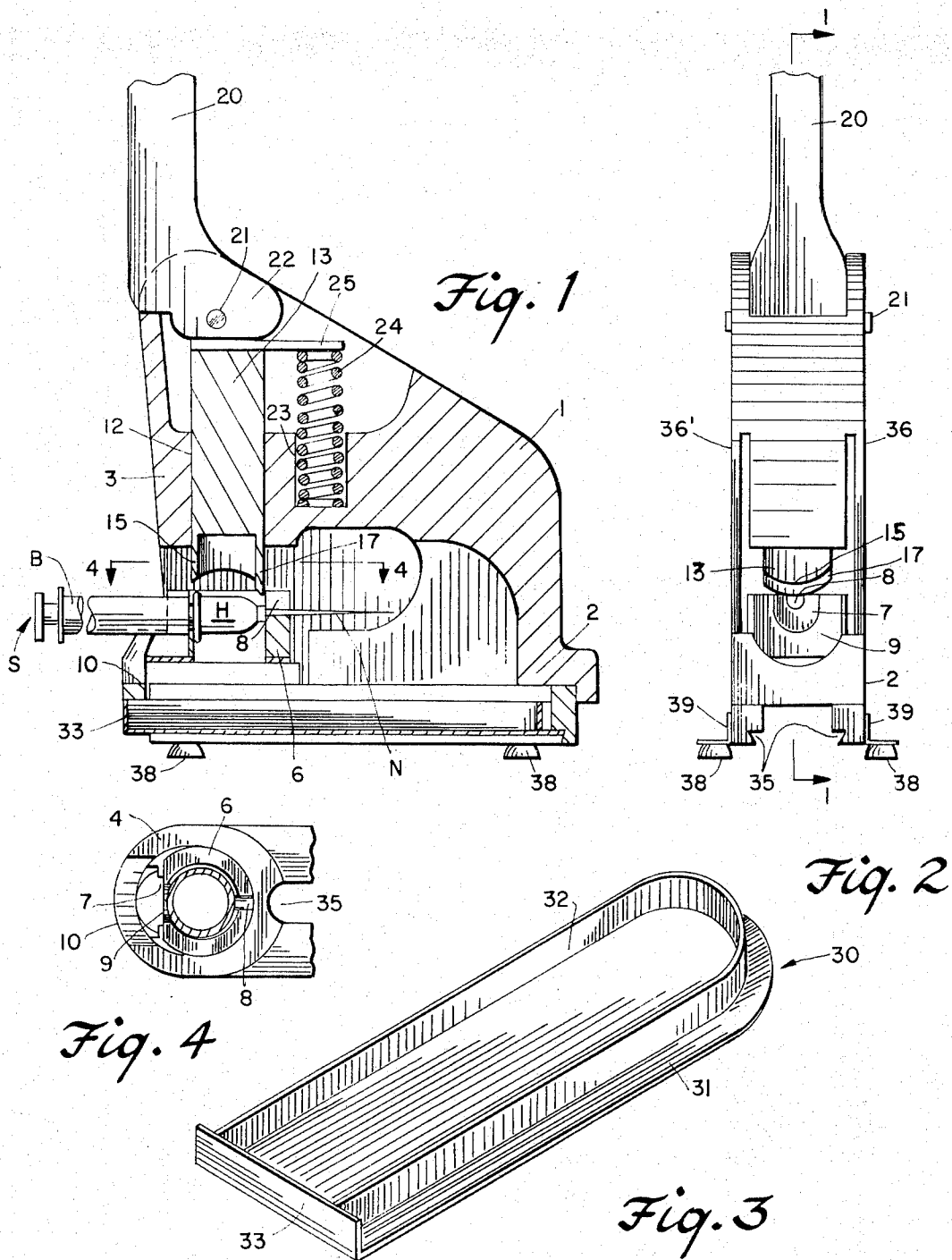
Primary Examiner—J. M. Meister
Attorney—Samuel Lebowitz

[57] **ABSTRACT**

A cutting punch for destroying effectively the components of hypodermic syringes, after their use, in order to prevent the salvaging thereof from waste receptacles for eventual use as essential paraphernalia in the illicit drug field. An annularly shaped female cutter member is fitted with diametrically opposed slots for supporting the cannular needle and the syringe elements extending therefrom in horizontal position, and a cylindrical cutting punch is brought downwardly into engagement with the cutter member to sever the needle and another part of the syringe, to destroy the assembly rapidly in a manner rendering impossible its repeated use.

8 Claims, 4 Drawing Figures





CUTTING PUNCHES FOR DESTROYING HYPODERMIC SYRINGES

This invention relates to an apparatus for rapidly and effectively destroying single-use hypodermic syringes after their intended use, in order to prevent the improper re-use of them or the diversion of these devices into illegal channels.

It is the object of the present invention to provide a rugged and reliable instrument of low cost, which is capable of destroying hypodermic syringes of any type and capacity so that unauthorized re-use of the syringes is reliably prevented.

The problem of illegal salvaging of hypodermic syringes used in hospitals, clinics and doctors' offices for diversion to improper uses of such syringes, for example, as essential paraphernalia in the illicit drug field, or repeated use of the syringes in non-sterile condition, is a prevalent one. Patents have been granted for syringe destroying devices to cope with the problem, as exemplified by U.S. Pat. Nos. 3,404,593, Oct. 8, 1968, 3,469,750, Sept. 30, 1969, and 3,585,835, June 22, 1971, but these have failed to meet commercial acceptance. The present invention seeks to improve upon the expedients disclosed in these patents by providing a simple instrument which occupies a minimum amount of space and which may be placed upon a desk, table or other supporting surface and which, by a simple manipulation, similar to that executed by an office seal press, is capable of destroying the spent syringe in multiple parts so that the re-use of any of such parts is rendered impossible.

The invention contemplates the provision of a compact and economical tool assembly resembling a corporation or notarial seal, which is of sufficient weight to rest with stability on a supporting surface, and which stability may be enhanced with suction cups, magnetic discs, or frictional retainers, if desired. The forepart of the base is fitted with an annularly shaped cutter member fitted with grooves adjacent to its upper surface for supporting, in a horizontal position, the cannular needle of the hypodermic syringe and another part of the syringe spaced from the needle, preferably along the longitudinal axis of the tool. A cylindrical plunger, which is normally biased in a position spaced from the annular cutter member, is provided with cutting edges at the lower end thereof, and is reciprocally mounted in the tool in overlying relation to the annular cutter member.

An arm or handle, provided with an eccentric portion, is pivotally mounted on the upper part of the tool. A simple rotary movement of the arm moves the eccentric part against the upper end of the plunger, to force the cutting edges into the interior of the annular cutter, which severs the cannular needle and a larger portion of the hypodermic syringe which is adapted to be positioned within the grooves at the top of the cutter member. The larger portion of the syringe may be either the hub of the needle, which is mounted on the outlet end of the barrel, or may be the barrel itself, depending upon the specific structure and size of the hypodermic syringe.

A removable receptacle, which may be a sliding drawer or similar device, is provided at the bottom of the base of the tool, and confining lateral walls on the latter provide assurance that the small severed portions of the syringe are received within the receptacle, leav-

ing only the severed barrel portion to be discarded immediately. The waste receptacle may be emptied periodically as the severed needles and hubs accumulate therein.

Other objects and purposes will appear from the detailed description of the invention following hereinafter, taken in conjunction with the accompanying drawing, wherein

FIG. 1 is a longitudinal sectional view of the tool in accordance with the invention along the median plane thereof, with a spent hypodermic syringe in position to be severed at multiple points, taken along line 1—1 of FIG. 2;

FIG. 2 is a left end view of FIG. 1 with the hypodermic syringe removed for the sake of clarity;

FIG. 3 is a perspective view of the drawer receptacle mounted in the base of the tool; and

FIG. 4 is a horizontal sectional view along line 4—4 of FIG. 1.

In the drawing is shown a tool standard 1 of rugged construction, resembling seal presses such as corporate or notarial seals which are used for embossing impressions in paper. Such a press may be of the type shown in U.S. Pat. No. 1,605,869, Nov. 2, 1926. The tool is generally fabricated of metal, such as cast iron, and its weight imparts a high degree of stability for support on a desk, table or other supporting surface.

The tool comprises a standard 1, a base 2 extending forwardly therefrom and an overhang portion 3 above the base. The upper surface of the forepart of the base is fitted with a die retainer 4 in which is seated an annularly-shaped female cutter member 6 provided with a groove 7 at the front of the latter and a groove 8 at the rear thereof. These grooves are preferably of substantially semi-cylindrical outline and serve to support the hypodermic syringe S in substantially horizontal position, so that the cannular needle N is supported in groove 8 and extends rearwardly therebeyond while the enlarged portion of the syringe which may be either the hub H or the barrel B are supported by the wider groove 7. The latter is disposed in a truncated portion of the cutter member 6, which permits the small thickness of latter between the inner diameter of the member and front vertical face to fit between the large end of the hub H and the inner end of the barrel B. The device is capable of destroying hypodermic syringes of all capacities and in order to accommodate barrels of large diameter, the tool support 4 and the front of the base may be recessed to provide a large groove 10 forwardly of the flattened face 9 of the female cutter member 6.

The forepart of the overhang portion 3 is bored with a cylindrical passage 12 to accommodate a cylindrical plunger 13 having cutting edges 15 and 17 at the lower end thereof which cooperate with the internal upper edge of the female die element 6 and which are adapted to sever the parts of the hypodermic syringe which rest in grooves 7 and 8 when the cylinder 13 is moved into the interior of the female cutter member 6. The cutting edges 15 and 17 may be ground separately, or these may constitute parts of a continuous circular cutting edge. The cutting edge 17 may project further since it encounters the needle first for the cutting operation.

The cylindrical plunger 13, with its cutting edges 15 and 17, is normally biased in an upward direction into spaced relation with respect to the annularly shaped cutter member and support for the hypodermic syringe.

This bias is effected by means of spiral spring 24 having the lower portion thereof seated within a cylindrical recess 23 in the overhang portion 3 and with the upper portion pressing upwardly against plate 25 extending rearwardly from the plunger 13. An actuating arm 20 is pivotally mounted within the tool on pin 21 and is provided adjacent the pivot point with an eccentric portion 22 so that when the arm or handle 20 is rotated in a clockwise direction, the eccentric portion 22 presses the plunger 13 downwardly with great mechanical advantage against the biasing force of spring 24, to effect the cutting operation between the cooperating cutting edges 15 and 17 with the cutter member 6 adjacent to the supporting grooves 7 and 8.

The base is provided with channels 35 for the purpose of guiding a drawer 30 into nested position below the base. An upstanding wall 33 at the front and wall 32 at the sides and rear 32 extend from the bottom of the drawer 31, which serves to receive the severed portions of the cannular needles N which drop through the opening 35 into the base as well as the larger portions of the syringes, for example, the hubs H which drop into the drawer 30 through the opening in the bottom of the annularly shaped cutter member 6. The drawer may be emptied periodically. Lateral walls 36,36' extend downwardly from the sides of the tool to enclose the latter, so that the severed parts are confined to the interior of the tool and drop into the drawer without scattering beyond the walls thereof.

The tool is sufficiently heavy so that the base rests on the supporting surface with stability. This stability may be increased by providing suction cups 38 lateral brackets 39 affixed to the lower end of the base. Two of these brackets on each side are sufficient. Alternatively, magnetized elements may be provided for magnetic attraction to a sheet metal support of iron or steel.

It is understood that the cylindrical cutting punch may be formed of any desired metal and may be provided with hardened tool steel adjacent to only the lower end thereof. Any desirable cutting tool alloy may be used for the fabrication of the annularly-shaped cutting member 6. The internal diameter of the latter may be approximately three-fourth inches and an external diameter of about one to one and one-half inches provides adequate radial support for the cannular needle and the larger part of the syringe as it is severed into three parts.

If desired, interchangeable cutter members may be mounted in the die retainer. These may have the same internal diameter for cooperation with the cutting punch at the lower end of the reciprocating plunger.

I claim:

1. An apparatus for destroying spent single-use hypodermic syringes for liquid medicaments each comprising a cannular needle having a point at one end and an enlarged section at the opposite end communicating with the barrel for the medicament, comprising

- a. a base,
- b. an annularly shaped cutter member mounted on said base provided with aligned grooves of different depth along a medial line of said cutter member adapted to support the syringe thereon along a line coincident with the axis of said grooves, with the needle adapted to rest in the shallower groove and the enlarged section in the deeper groove,
- c. a cylindrical cutting punch provided with cutting edges at the lower end thereof for interengagement

with the inner diameter of said cutter member, and d. means for moving said cutting punch into said cutter member with great force to sever said needle resting in said first-mentioned groove and said enlarged section resting in said deeper groove.

2. An apparatus as set forth in claim 1, wherein said last-mentioned means comprises a pivoted handle having an eccentric portion overlying the top of said cylindrical cutting punch for moving the bottom edge thereof into said cutter member.

3. An apparatus as set forth in claim 2, including a detachable receptacle in said base below said cutter member for receiving the parts of said syringe severed from the medicament barrels.

4. An apparatus as set forth in claim 4, including lateral walls extending upwardly from said base to confine the scattering movement of the several severed parts to any place other than said receptacle.

5. An apparatus as set forth in claim 2, wherein the enlarged section of the cannular needle is coincident with the hub of the syringe which rests within the deeper groove and which is severed by the forward edges of the cutter member and cutting punch.

6. An apparatus as set forth in claim 5, including an additional groove in said base forwardly of said annular cutter and deeper than both grooves in the latter for supporting the barrel of the syringe in the course of the cutting operation.

7. An apparatus as set forth in claim 2, wherein the deeper groove in said cutter member is of sufficient depth to accommodate the barrel of hypodermic syringes of small capacity for severance by the cutting punch.

8. An apparatus for destroying spent single-use hypodermic syringes each comprising a cannular needle having a point at one end and a hub at the opposite end connected to the barrel for the medicament, comprising

- a. a tool standard having a horizontal base extending forwardly therefrom and an overhang portion spaced from and overlying said base,
- b. an annularly-shaped female die element seated on said base at the forward portion thereof, provided with a cutting edge at the top of the interior thereof, of an internal diameter to support the hypodermic syringe for severance at the needle and hub portions thereof,
- c. a vertically reciprocable plunger in said overhang portion of said standard terminating in cutting edge portions at the lower end thereof spaced at least at diametrically opposed parts of said lower end,
- d. spring means connected with said plunger to bias said lower end of said plunger into spaced relation with respect to said cutting edge of the female die element,
- e. manual means pivotally mounted on said overhang portion of said standard above the upper end of said plunger and including eccentric means cooperating with the latter to depress said plunger, with great mechanical advantage, into cooperative cutting engagement with said female die element, whereby the cutting edge at the inner diametral part of said plunger is adapted to sever the cannular needle while the cutting edge at the outer diametral part of said plunger is adapted to sever a thicker portion of the hypodermic syringe which is adapted to be disposed horizontally on said female

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die element for destruction, with the barrel of the syringe extending forwardly and the cannular needle extending rearwardly beyond said female die element, and

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f. a slidable drawer in said horizontal base below said female die element for collecting the severed needle and hub portions for ultimate disposal.

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