

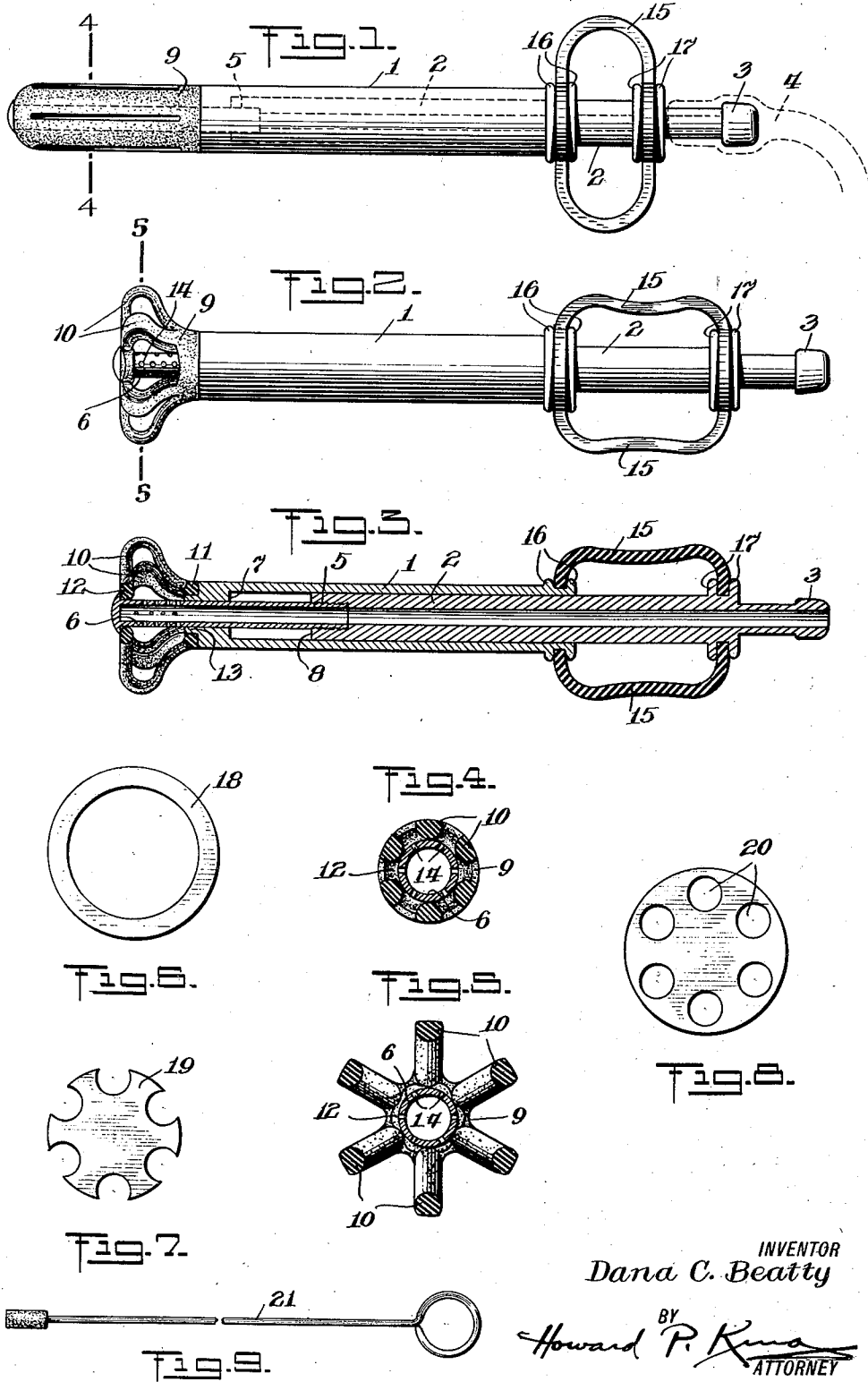
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SYRINGE

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## UNITED STATES PATENT OFFICE

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## SYRINGE

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This invention relates to syringes and more particularly to mechanically dilated vaginal syringes and the method of making the same.

The objects of the invention are to provide  
 5 a syringe of this character wherein the mechanical dilation may be secured by relative movement of slidable parts; to employ improved flexible dilators for dilation by said  
 10 slidable parts; to employ dilators properly made of such materials as molded rubber so as not to be injurious in use; to minimize the number of parts and enable the same to be inexpensively manufactured and assembled; to  
 15 utilize the resiliency of the dilators to both secure the proper shape when dilated and return them to normal position when released; to provide a structure wherein said  
 20 dilators normally assume a position closely adjacent to the body of the syringe under the influence of their own resiliency; to obtain a projection of the dilators away from the  
 25 body portion by means enabling the device to be manipulated with one hand; to permit rotation of the dilators with respect to the body members; to enable the use of the device for  
 30 medical purposes; to permit ejection of dry powder from the nozzle end of the device; to secure simplicity of construction and operation and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawing in which like numerals of reference indicate similar parts throughout the several views;

35 Figure 1 is a side elevation of a syringe embodying my invention, showing the dilators in normal position;

Figure 2 is a similar elevation showing the dilators dilated;

40 Figure 3 is a view similar to Fig. 2 showing the device in longitudinal section;

Figure 4 is a sectional view on line 4—4 of Fig. 1;

45 Figure 5 is a sectional view on line 5—5 of Fig. 2;

Figure 6 is an end view of the outer die for making the dilators;

Figure 7 is a similar end view of the inner die or core for making said dilators;

50 Figure 8 is an end view of said inner die

or core in course of manufacture thereof; and

Figure 9 is an elevation of a certain plunger to be used in connection with my invention.

In the specific embodiment of the invention illustrated in said drawing reference  
 55 numeral 1 indicates an outer body portion which is preferably elongated and tubular and slidably mounted upon an inner body portion 2 which is likewise tubular and  
 60 equipped at one end with a bead 3 for receiving and holding a water tube 4 to enable a supply of water to be passed through the said inner body member 2 as is usual in syringes. The other end of the beaded section of the  
 65 tubular body portion 2 terminates within the outer member and is screw threaded to receive the shank of a fountain head 5 suitably perforated so as to provide for proper spray when the water is passed through it. This  
 70 main or beaded section of the tubular body portion and the fountain head 5 are preferably secured permanently together in manufacture so the user never has them apart, and will be referred to herein jointly as the tubular  
 75 body portion. This tubular body portion is preferably longer than the outer body portion and is rotatable thereon and prevented from sliding out of the outer member at the fountain head end by an inwardly directed  
 80 shoulder 7 on the outer body member around the shank 6 of the tubular member and overlying the end 8 of the main section of said tubular member.

Mounted on the end of said outer body member adjacent the fountain head is a flexible  
 85 sleeve 9 providing a plurality of dilators 10, said sleeve 9 preferably being made of resilient material such as rubber with the dilators 10 integral with collars or bands 11, 12  
 90 at opposite ends of the several dilators. One of these bands, as 11, fits rotatably onto a neck 13 at the upper end of the outer body member, and the other band 12 fits rotatably around the shank 6 under the button head  
 95 thereof. Since separation of the inner and outer members is limited by the above described shoulders, the sleeve will remain on the neck of the outer member under all conditions, and both of the members may be rotated without necessarily rotating said sleeve. 100

The dilators and collars formed integrally as indicated form a sleeve with an outside diameter substantially that of the outer body member so said sleeve forms a continuation of the outer surface of said body member. The resiliency of the fingers and sleeve is such as to normally position the fingers side by side against the inner body member or water tube. Because of the interior shoulders, the outer member can slide no further in a direction away from the fountain head end of the device than to permit the sleeve to be just in its normal cylindrical condition, but in the other direction the outer member meets no such shoulders and may be slid, as a result of which the dilators will bulge outward as their opposite ends approach each other, this position being clearly shown in Figures 2 and 3, and for brevity being called herein the dilating position. When the user releases the outer member, after having slid it to obtain dilation of the dilators, the resiliency of the dilators causes the said member to return to normal position as shown in Fig. 1, with the dilators again close to the inner body member.

The inner body member or shank 6 thereof is perforated below the fountain head within the confines of the sleeve, as at 14 preferably at such position as to be substantially opposite the peak of the bulge of the dilators when they are bent outward to their greatest extent. These perforations open through to the water passage in said body member and obtain a spray of water outwardly through the fingers when the same are dilated.

In order to provide means for sliding the outer member with respect to the inner member, particularly by a means which can be operated by one hand, I show in the drawing an operating yoke 15. This yoke is so arranged that one part of it is carried rotatably and non-slidably on the end of the outer member away from the sleeve, and an opposite part of the yoke is carried also rotatably and non-slidably by the inner member adjacent the beaded end thereof. Consequently by compressing the intermediate parts of the yoke 15 toward each other a moment of force is set up establishing a relative sliding movement between the inner and outer members as clearly illustrated in comparing Figures 1 and 2. As shown, the rotatable and non-slidable attachment of the yoke to the said members is accomplished by spaced circular ribs 16, 16 on the outer body member and similar spaced annular ribs 17, 17 on the inner body member, the yoke fitting between the ribs with sufficient play to enable the same to rotate without binding upon the body members. Preferably the yoke is of resilient material, such as rubber, and has a normal shape such as shown in Figure 1 as to tend to slide the body members together with shoulders 7 and 8 in engagement.

However, the user may very readily press the bow portions of the yoke together and slide the upper member and sleeve to dilating position, and immediately on release of the pressure on the yoke, its inherent resiliency together with the resiliency of the dilators returns said members to normal position with the shoulders 7 and 8 again in engagement.

I desire to point out at this time that in the construction of my improved syringe that I provide dilators which bend immediately under the button head of the device when the dilators are forced into dilating position. This release in the dilators having an extreme dilation at a point very close to the head of the instrument. To accomplish this purpose I provide the slits in the sleeve as close to the end of the sleeve as practical and reinforce the dilators with as much material as practical so the bending of the dilators will tend to bend and stretch the collar at the outer end of the instrument rather than bending the dilators adjacent the collar. In this action, it may also be pointed out that the collar is preferably shaped so that it will have minimum engagement with the inner member and thus not interfering materially with the independent rotation of the member with respect to said collar in any position of the dilating sleeve. Likewise the dilators are preferably rounded both inside and out as clearly shown in Figure 5 so as to eliminate any sharp edges and to provide on the inner faces of the dilators surfaces which will deflect the jets of water rather than flat surfaces which would interfere with the jets performing a useful purpose.

The device is particularly adapted for medical purposes, in that I am enabled to inject medicine in powder form into the human channels. To do this, the powder is inserted into the central bore of the device down to the perforations 14, but cannot pass out of the instrument because of the surrounding sleeve. The doctor may hold and inject the instrument and with the same hand then dilate the dilators. A plunger 21, already partially inserted in the bore may then be slid all the way by movement of a finger of the same hand, thereby ejecting the powder through perforations 14.

The provision of rounded edges on the dilators is a matter of considerable importance and I have devised a new mode of manufacture enabling me to obtain rounded corners in molded rubber. I provide a one piece outer die 18 the inside diameter of which is substantially equal to the outside diameter of the finished sleeve. I also provide a core or inner die 19 the outside diameter of which is such that it substantially fits within the outer core. This inner die or core is preferably made by drilling parallel holes 20 therein of a diameter substantially the width

of the dilators and spaced in the relationship that the dilators are to have. This blank in which these holes are made is preferably larger than the die is to be when completed, and after the holes are drilled then the blank is turned down, partially exposing the drilled holes at one side. The operations are such that the blank is turned down less than the distances of the center of the holes whereby the holes left in the finished core are more than semi-circular. The core is inserted in the outer die and rubber is pressed therein thereby getting a curved inner surface as well as curved inner edges to the dilators at the outer surface of the sleeve.

Obviously detail changes and modifications may be made in the construction and use of my improved syringe without departing from the spirit and scope of the invention disclosed, and I do not wish to be understood as limiting myself to the exact construction except as set forth in the following claims when construed in the light of the prior art.

Having thus described my invention, I claim:—

1. A syringe or the like comprising inner and outer members slidable and rotatable with respect to each other, and dilators mounted on said inner and outer members independently rotatable with respect thereto so as to avoid twisting said dilators at relative rotation between said members and adapted to be dilated when the members are slid in one direction.

2. A syringe or the like comprising inner and outer members slidable and rotatable with respect to each other, dilators mounted on said inner and outer members independently rotatable with respect thereto so as to avoid twisting said dilators at relative rotation between said members and adapted to be dilated when the members are slid in one direction, and means for sliding said body members.

3. A syringe or the like comprising inner and outer body members, a dilator carried by said members adapted to be dilated by sliding the same, and a resilient loop connected to both said members for dilating said dilator a definite amount.

4. A syringe or the like comprising a sleeve having dilator adapted to be bent outwardly, said sleeve having its outer end providing an integral narrow flexible collar to the ends of the dilators whereby the said collar will turn outwardly with the dilator and the dilator will project substantially perpendicularly when dilated from the axis, and means for actuating said dilators.

5. A syringe or the like, a sleeve having a substantially cylindrical outer surface having a plurality of narrow slits the portions of the sleeve between said slits constituting dilators, said dilators each having a rounded inner surface and rounded corners at its outer

edge, and means for actuating said dilators.

6. A syringe or the like comprising members movable relatively with respect to each other, a dilator adapted to be operated by relative movement of said members, and a resilient loop attached to both of said members for both holding said syringe and for operating said members.

7. A means for operating members slidable one with respect to the other, comprising a loop of resilient material adapted to be squeezed in one direction and thereby elongated in another direction and having means for attachment to the members to be operated at the ends of said loop which may be elongated.

8. In combination with a syringe or the like having members slidable with respect to each other, a means for operating said members, comprising a loop of resilient material adapted to be squeezed in one direction and thereby elongated in another direction, said loop having means for attachment to the members to be operated at points on the loop which move apart in elongating the loop.

9. In combination with a syringe or the like having members slidable with respect to each other, a means for operating said members, comprising a closed loop having perpendicular axes, said loop being of resilient material adapted to be squeezed in one direction along one axis and thereby elongated in a perpendicular direction along the other axis, said loop having opposite means on one of the axes for attachment of the members to be operated to said loop.

10. In combination with a syringe or the like, a dilator comprising a soft pliable sleeve having slots therein extending through the wall of the sleeve and of less length than said sleeve, thereby enabling the portions of the sleeve disposed between said slots to be bent outwardly from normal position and likewise enabling the outwardly bent portions to bend circumferentially of the sleeve.

11. In combination with a syringe or the like, a dilator comprising a soft pliable sleeve having longitudinal slots therein extending through the wall of the sleeve and of substantially the length of said sleeve, thereby enabling the portions of the sleeve disposed between said slots to be bent outwardly from normal position and providing end portions beyond the ends of the slots forming pliable collars for gripping parts of the syringe.

12. In combination with a syringe or the like, a dilator comprising a soft pliable sleeve having slots therein extending through the wall of the sleeve of substantially the length of said sleeve with the ends of said slots spaced only slightly from the ends of the sleeves for providing soft pliable collars for gripping parts of the syringe, thereby enabling the portions of the sleeve disposed between said slots and collar to bow outwardly in opera-

tion upon lessening the distance between the collars with the collars both flexing and maintaining their grip.

13. In combination with a syringe or the like, a dilator comprising a soft pliable sleeve having slots therein extending through the wall of the sleeve and terminating short of the ends of said sleeve, said sleeve being attached at its ends to the syringe by gripping action of the unslotted portions of said sleeve.

14. In combination with a syringe or the like, a member providing a plurality of discharge openings, and a resilient sleeve normally obstructing said openings and adapted to be flexed to expose said openings and permit discharge to be ejected therefrom.

15. In combination, a syringe or the like comprising a tubular member perforated at one end portion thereof for providing a plurality of discharge openings, a resilient sleeve normally obstructing said openings and adapted to be flexed to expose said openings, and means for flexing said sleeve.

16. In combination, a syringe or the like comprising a tubular member perforated at one end portion thereof for providing a plurality of discharge openings, a resilient sleeve normally obstructing said openings whereby powder or the like may be retained within said tubular member adjacent said openings and be protected against exterior fluid by said sleeve, and means for ejecting said powder through said openings.

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### DISCLAIMER

1,870,942.—*Dana C. Beatty*, New York, N. Y. SYRINGE. Patent dated August 9, 1932. Disclaimer filed October 9, 1936, by the assignee, *Gynex Corporation*. Hereby enters this disclaimer to claims 4, 10, 11, 12, and 13.  
[*Official Gazette November 3, 1936.*]