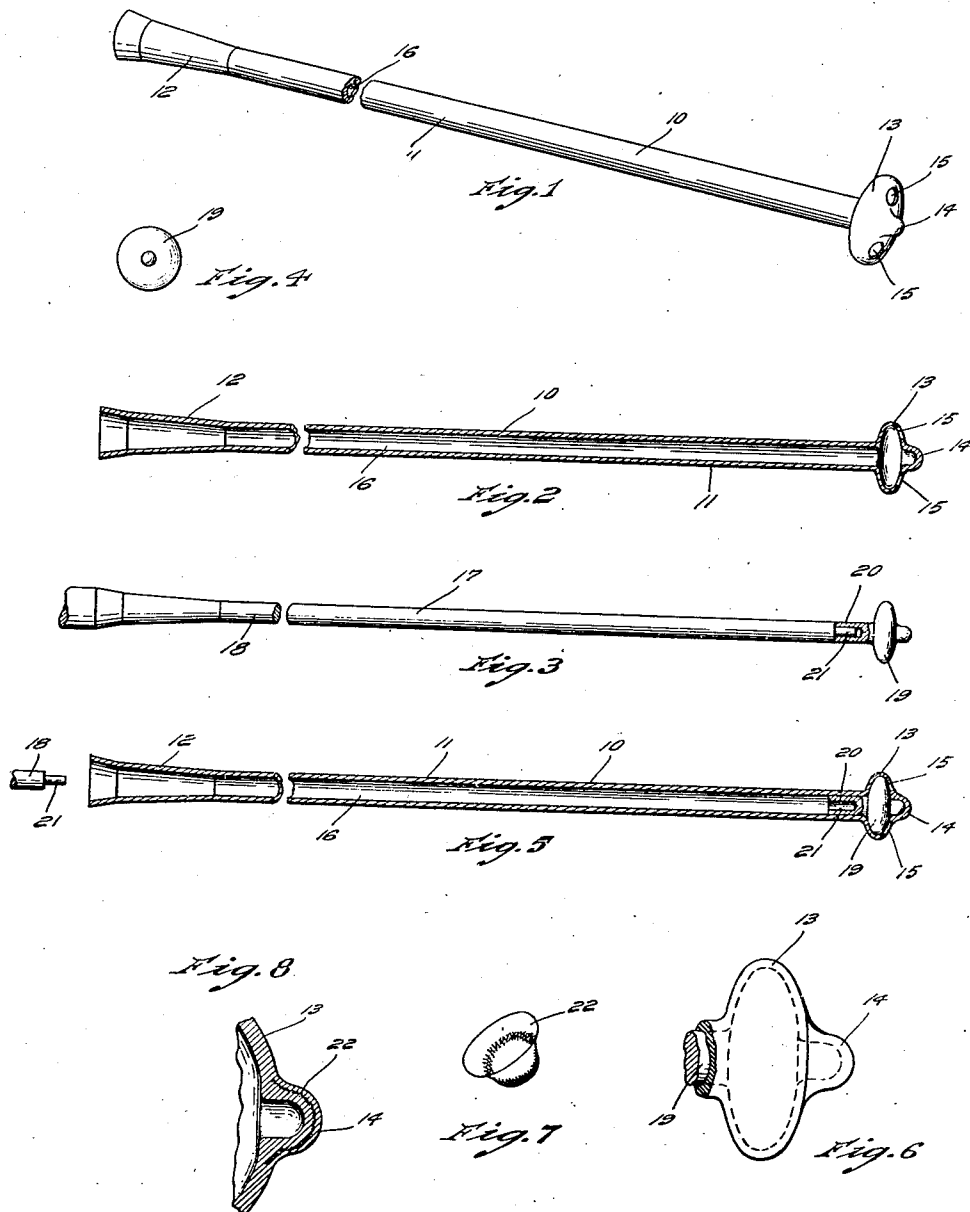


Oct. 21, 1941

P. A. RAICHE
CATHETER AND THE LIKE

2,259,488

Filed March 9, 1937



Inventor
Paul A. Raiche

By Nathaniel Frucht
Attorney

UNITED STATES PATENT OFFICE

2,259,488

CATHETER AND THE LIKE

Paul A. Raiche, North Providence, R. I., assignor
to Davol Rubber Company, a corporation of
Rhode Island

Application March 9, 1937, Serial No. 129,828

2 Claims. (Cl. 18—58)

My present invention relates to the manufacture of hollow rubber articles, and has particular reference to the manufacture of one-piece catheters of the Pezzar type.

The Pezzar type catheters are of the self retaining type, with an enlarged button at the end having drainage openings or eyes, and is used during bladder and similar operations for flushing and drainage. These catheters have heretofore been made of several pieces, cemented and seamed together, the joined parts being placed in a mold and cured by the blown method. Since the catheters must be stretched to reduce the size of the button to allow for easy introduction and removal, there is a resultant strain on the seams for the parts, and particularly in the base of the button, and grave danger of separation during the introduction and removal.

It is the principal object of my invention to provide a novel method of manufacture which obviates the use of separate parts and results in a unitary catheter construction.

It is a further object of my invention to provide strengthening means for preventing breakage of the catheter tip during the stretching of the catheter.

An additional object of my invention is to simplify the manufacture of catheters and the like, whereby the cost of manufacture is reduced and the price to the user lowered.

With the above and other objects and advantageous features in view, my invention comprises a novel method of manufacture and a novel article obtained thereby, more fully disclosed in the detailed description following, in conjunction with the accompanying drawing, and more specifically defined in the claims appended thereto.

In the drawing,

Fig. 1 is a perspective view of the novel one-piece catheter;

Fig. 2 is a vertical section therethrough;

Figs. 3, 4 are respectively plan and end views of the novel former, parts being broken away in the plan view;

Fig. 5 is a section of the catheter after forming, showing the method of removal of the former parts;

Fig. 6 is a detail view showing the initial forming steps for the tip;

Fig. 7 is a perspective view of a reinforcing cap; and

Fig. 8 is a detail enlarged section of the completed tip, showing the reinforcing cap integrally imbedded therein.

In the drawing, the novel catheter 10 includes

an elongated tubular length 11, a funnel shaped inlet cone 12, and a button 13 of relatively large width, the button having a tip 14 and drainage eyes 15 communicating with the interior of the catheter, which forms a flow passageway 16. In forming the catheter, a former 17 such as illustrated in Fig. 3 is used, having a base 18 and a removable or detachable top 19, the top having a socket 20 and the base a pin 21 insertable therein, the shape of the former being identical with the desired interior catheter outline.

With the former assembled as shown in Fig. 3, it is dipped into a solution of rubber or rubber compound either natural or synthetic, in an evaporatable vehicle, the preferred solution being of latex, until the catheter has been built up by successful dippings, and is then cured on the form; pre-cured rubber solution may be used if desired. The rubber catheter is then removed from the form as indicated in Fig. 5, by withdrawing the base 18. The eyes 15 may then be formed by cutting out or in any desired manner, or may if preferred be formed while the base is still in the catheter. In either case, the base being removed, the top 19 is then removed by stretching one of the eyes 15 to permit passage of the top therethrough, whereby the completed catheter is then obtained as shown in Fig. 2.

If desired, the tip 14 of the catheter may be reinforced, as this tip is engaged by the end of an elongated pin which is used for stretching the catheter during insertion and withdrawal. A preferred manner of reinforcing the tip is to initially coat the form so as to obtain a thin coating as indicated in Fig. 6, and to then position a reinforcing cap 22 of any suitable material, preferably textile, over the thinly coated tip, the coating then being continued until the tip is completed, as shown in enlarged form in Fig. 8, whereby the reinforcing cap 22 is imbedded in the tip 14 as an integral part thereof.

The novel catheter is thus formed as an integral article, without seams or weak portions, and with a reinforced tip, whereby a more effective article is more readily manufactured, with a resulting decrease in the cost of manufacture and in the price to the purchaser.

I have described a method of manufacture which is particularly suitable for the formation of an integral Pezzar catheter, but the same method may be employed for the manufacture of any hollow rubber article which has one closed end of larger section than the main body. Any desired shape of the former parts, in the type of solution used, in the rubber or rubber com-

pound used, either natural or synthetic, and in the shape and material for the reinforcing cap, may be made to suit the requirements for different article designs, without departing from the spirit and the scope of the claims as appended hereto.

I claim:

1. In the manufacture of rubber articles, the steps of assembling separable parts into a form, one end part being of greater width than the part adjacent thereto, dipping said assembled form in a rubber solution to produce the article, positioning a non-elastic reinforcement on part of said article between dips to imbed the reinforcement as an integral part of the article,

forming an opening in the article adjacent said end part, and removing said form parts separately from said article, said end part being removed through said opening.

2. In the manufacture of Pezzar catheters, the steps of assembling a shank form and a button form to provide an assembled form, dipping the assembled form in a rubber solution to produce the catheter, inserting a non-elastic cap on the end of an initial coat to be imbedded by subsequent dipping, cutting an eye in the catheter adjacent the button form, and withdrawing the shank form through the catheter body and the button form through the eye.

PAUL A. RAICHE.