

[54] **CHUCKING ATTACHMENT FOR
INSERTION OF A FINE FLEXIBLE TUBE
INTO AN ENDOSCOPE**

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279/46 R; 128/2 M**

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[58] Field of Search **128/2 M, 2 B, 2 R, 2 A,
128/348, 349 R, 214.4, 4; 279/1 Q, 23, 41 R,
46 R**

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[57] **ABSTRACT**

A chucking attachment for insertion of a fine flexible tube into a channel formed in the body of an endoscope wherein a guide member is detachably fitted to the open end of the channel; a chucking member wholly formed of relatively hard synthetic resin is slidably attached to the guide member; part of the chucking member is made flexible so as to pinch a fine similarly flexible tube inserted thereinto; the fine flexible tube is introduced into the channel of the endoscope through the chucking member and guide member, thereby enabling the fine flexible tube to be stepwise forced into the channel by being repeatedly pinched and released by the flexible portion of the chucking member when it slides up and down.

12 Claims, 11 Drawing Figures

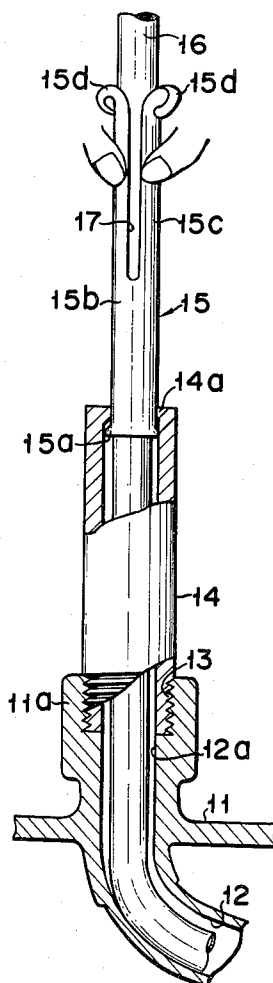


FIG. 1

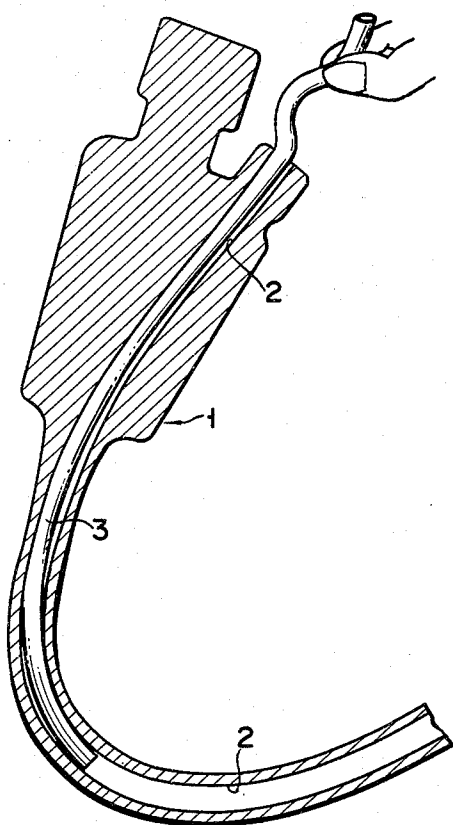


FIG. 2

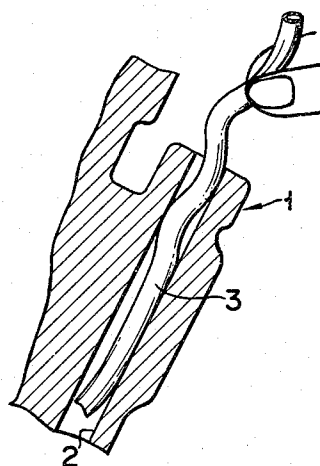


FIG. 3

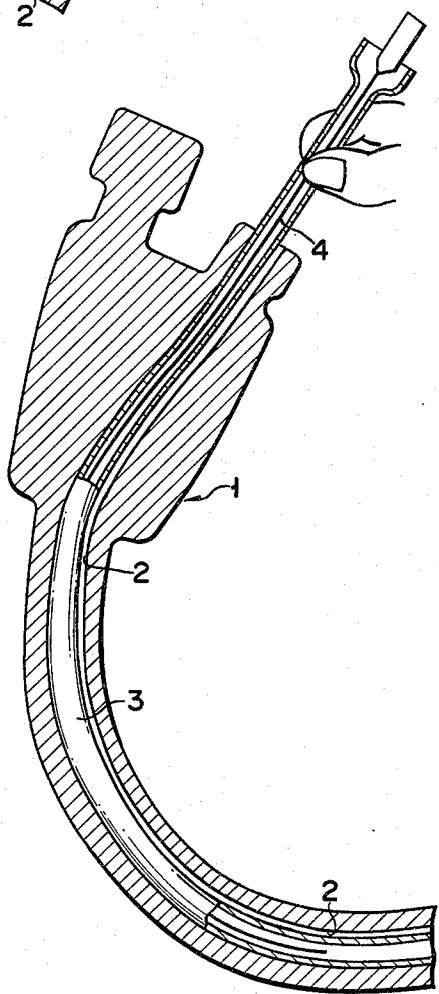


FIG. 4

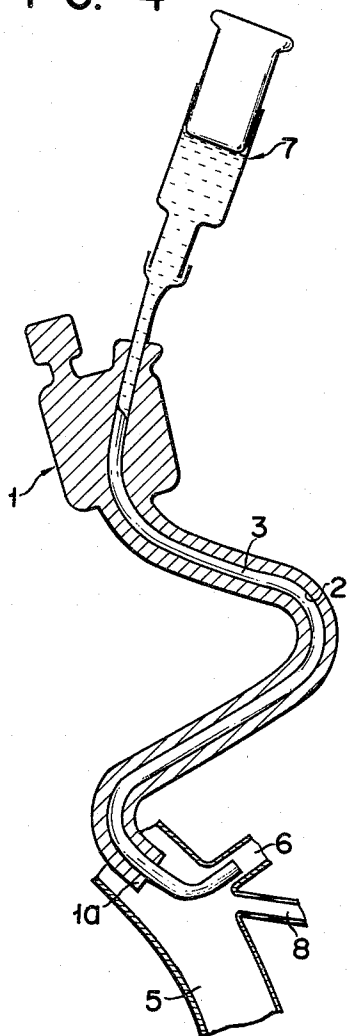


FIG. 5

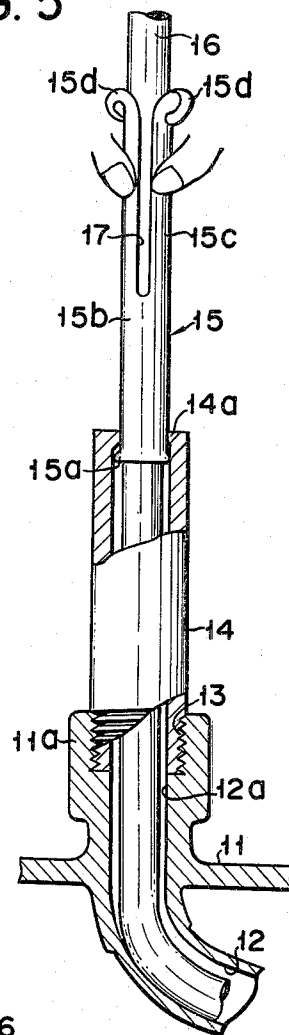


FIG. 6

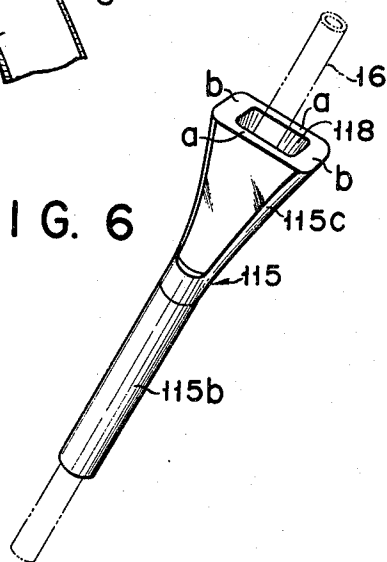


FIG. 7

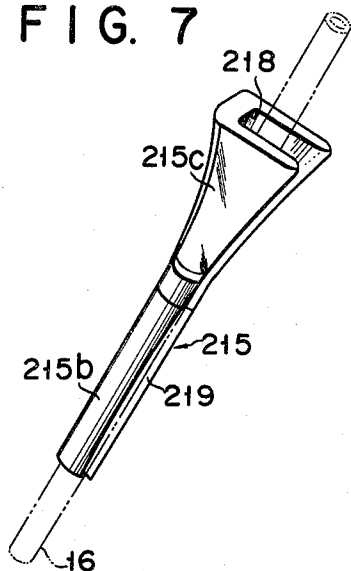


FIG. 8

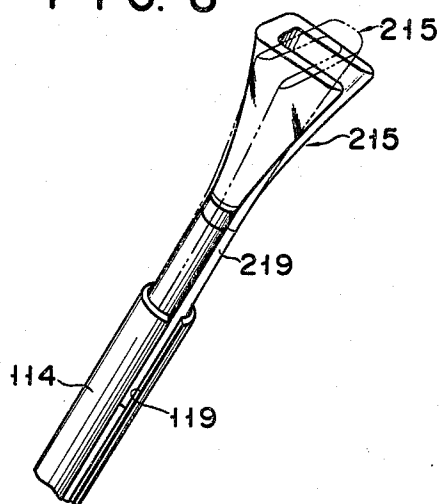


FIG. 9

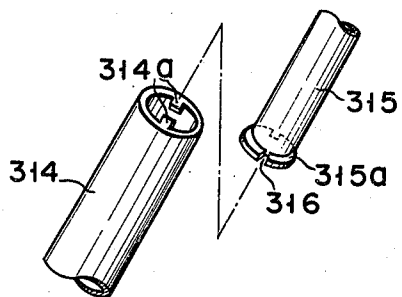


FIG. 10

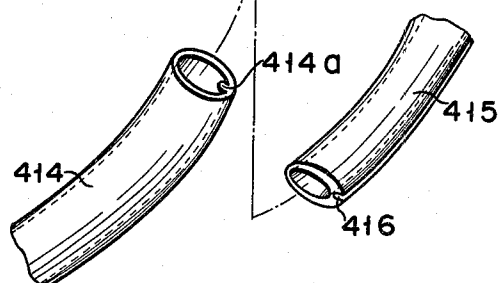
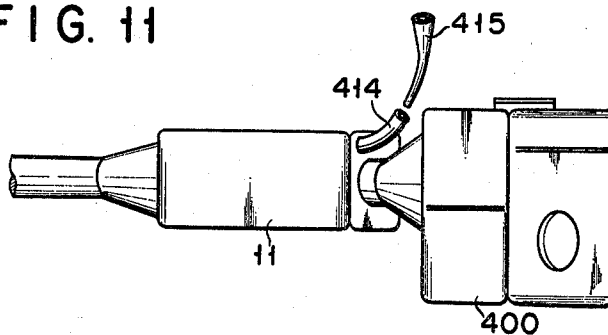


FIG. 11



CHUCKING ATTACHMENT FOR INSERTION OF A FINE FLEXIBLE TUBE INTO AN ENDOSCOPE

BACKGROUND OF THE INVENTION

This invention relates to an endoscope and more particularly to a chucking attachment capable of inserting a fine flexible tube, for example, a tube for bringing an X-ray photographing agent into the internal organs or a tube such as catheter for sucking a humor or body fluid out of said organs smoothly without buckling into the channel of the endoscope.

In recent years, an endoscope, particularly a fiberscope has come into use to observe or photograph the interior of the internal organs, for example, the stomach. The fiberscope is further so improved as to additionally function as a means for sucking a humor out of the internal organs, pouring an opaque X-ray photographing fluid thereinto or sampling part of the tissue of a living body.

To this end, the fiberscope is so designed as to enable a fine flexible tube to be inserted from the outside into any of the internal organs through a channel formed lengthwise in the outer flexible duct of the fiberscope. For more effective application of the aforesaid fine flexible tube taken into the internal organs, it is demanded that the inner diameter of said fine flexible tube be as much broadened as possible and consequently the outer diameter of said fine flexible tube be so enlarged as to cause the tube to abut against the inner wall of the fiberscope channel as closely as possible. Since the channel is flexed according to the bending of the flexible duct of the fiberscope, it is necessary that said fine flexible tube be made as thin as possible in order to be rendered sufficiently pliable quickly to match the flexed state of the channel and in consequence be prepared from as soft material as possible.

If, however, it is tried to construct the fine flexible tube in the above-mentioned manner, particularly by broadening its inner diameter, then a larger friction will arise between the outer wall of the flexible tube and the inner wall of the channel, presenting difficulties in causing the flexible tube smoothly to travel through the channel. Further, if an attempt is made to force the flexible tube through the channel, then the tube will be bent near the inlet of the channel, resulting in the so-called buckling.

There will now be further detailed by reference to FIGS. 1 and 2 the above-mentioned buckling of the fine flexible tube. Numeral 1 denotes an endoscope, for example, the type adapted for examination of the duodenum. A channel 2 is formed lengthwise in the outer flexible duct of the endoscope 1. A fine flexible tube 3 is inserted by the fingers, as illustrated, into the channel 2 through an inlet opening. The fine flexible tube 3 is generally made of Teflon, and plays the part of pouring an opaque fluid X-ray photographing fluid already introduced thereinto from the forward end of said flexible tube 3 into, for example, the pancreatic duct or bile duct of the duodenum so as to carry out X-ray photographing, namely, the so-called "endoscopic retrograde pancreato-cholangiography" now in common use. This photography is considered indispensable, for example, to discover the presence of pancreatic cancer or biliary concretion, or diagnose the development of these diseases.

In the case of the above-mentioned photography, however, the fine thin flexible tube 3 is readily subject

to buckling near the inlet opening of the channel 2 before said tube 3 is taken therinto. If, under this condition, an attempt is made to force the flexible tube 3 into the channel 2, then the tube 3 will present buckling again as shown in FIG. 2, causing its outer wall to be forcefully pressed against the inner wall of the channel. If, therefore, it is tried to push the flexible tube 3 further into the channel 2, then buckling will arise in succession due to increased friction between the channel 2 and tube 3, completely preventing the tube 3 from moving forward through the channel 2.

To avoid the appearance of the above-mentioned buckling, therefore, the customary practice has been to insert the flexible tube 3 of Teflon into the channel 2 in a state previously supported by a core metal 4 extending lengthwise through the tube 3, and draw out the core metal 4 after the tube 3 is brought to the prescribed position. However, this practice has been found extremely inconvenient due to a great deal of time being consumed, where a physician is going to insert a fiberscope into the body of a patient for instant diagnosis of the affected portion of his body by which he is supposed to be afflicted — such diagnosis should naturally be executed instantly. Moreover, the above-mentioned conventional practice is accompanied with the following significant drawbacks. Description will be given by reference to FIG. 4 which presents the condition where the flexible Teflon tube 3 is conducted through the channel 2 of the fiberscope 1 so as to have the forward end projected outward from the distal end 1a of said fiberscope 1 and taken into the pancreatic duct 6 open to the duodenum 5. Though, in this case, the flexible tube 3 was previously supported by the core metal 4 introduced therinto, FIG. 4 shows the condition where the core metal 4 was pulled out of the tube 3, though not indicated. The Teflon flexible tube 3 brought to the condition of FIG. 4 is fitted with a syringe 7 at the base end. An opaque X-ray photographing fluid is ejected by the syringe 7 from the forward end of the Teflon flexible tube 3 into the pancreatic duct 6 for the endoscopic retrograde pancreato-cholangiography of the interior of said pancreatic duct 6.

Since, in this case, the pancreatic duct 6 should receive only an opaque X-ray photographing fluid but not air exerting an adverse effect on said photography, the flexible tube 3 is filled with the opaque X-ray photographing fluid before the tube 3 is taken into the pancreatic duct 6, and then the forward end of the tube 3 is inserted to deliver the opaque X-ray photographing fluid into the pancreatic duct 6 by means of the syringe 7. As previously mentioned, however, the flexible tube 3 is supported, as customarily practised, by the core metal 4 before the tube 3 is made to pass through the channel 2. This practice has the drawbacks that the part of the tube 3 into which the core metal 4 is inserted can not be filled with the opaque X-ray photographing fluid in advance; and after withdrawal of the core metal 4, air enters that part of the tube 3 which is now left empty and is carried with the opaque X-ray photographing fluid into the pancreatic duct 6 to obstruct the X-ray photography. These drawbacks have risen significant problems with the prior art X-ray photographic process for examination of the internal organs of a patient. Accordingly, use of the core metal 4 as a support for the tube 3 being inserted into the chan-

nel 2 has been accompanied with considerable difficulties.

Referring to FIG. 4, numeral 8 denotes a bile duct open to the duodenum 5. Where the interior of the bile duct 8 is photographed by X-ray, the forward end of the flexible tube 3 is taken into the bile duct 8 as in the case of the pancreatic tube 6.

In connection with the above-mentioned X-ray photography, it may be considered theoretically possible to adopt a different process which comprises the steps of initially leaving the Teflon flexible tube 3 filled with air instead of being charged with opaque X-ray photographing fluid; bringing the forward end of the tube 3 near the inlet of the pancreatic duct 6 or bile duct 8 of the duodenum 5; attaching the syringe 7 filled with the opaque X-ray photographing fluid to the base end of the tube 3; pouring the fluid by the syringe 7 exactly to the forward end of the tube 3 completely to eject the air remaining in the tube 3 into the duodenum 5; inserting the forward end of the tube 3 into the pancreatic duct 6 or bile duct 8; and finally taking the opaque X-ray photographing fluid into said duct 6 or 8. However, this process presents considerable difficulties in determining the charged amount of the opaque X-ray photographing fluid required to fill the tube 3 exactly to its forward end and consequently is quite impracticable for the X-ray photography for examination of the internal organs of a living body which is demanded to be carried out unfailingly and quickly.

SUMMARY OF THE INVENTION

It is accordingly the general object of this invention to provide a chucking attachment for insertion of a fine flexible tube into the channel of an endoscope in order to resolve various difficulties hitherto accompanying said insertion.

According to an aspect of this invention, there is provided a chucking attachment of simple construction adapted for smooth insertion of a fine flexible tube into the channel of an endoscope. The chucking attachment comprises a cylindrical guide member fixed to the inlet opening of the endoscope channel and a chucking member vertically slidable through said guide member within a prescribed range. The chucking member consists of a cylindrical portion capable of such a slidable abutment against the outer wall of a fine flexible tube being inserted into the channel as to prevent the buckling of said tube when it enters the channel and a flexible portion made of, for example, flexible metal or relatively hard synthetic resin or rubber which can be flexed radially of said chucking member and, when depressed by the fingers, pinch the inserted flexible tube. When the fine flexible tube is partly inserted into the channel after passing through the chucking member and guide member, the chucking member is made to slide vertically through the guide member. During said slide, the fine flexible tube is repeatedly pinched and released by means of the flexible portion of the chucking member, and stepwise forced into the channel for a prescribed distance each time. During this insertion, any part of the fine flexible tube is firmly held by the guide member and chucking member, each time said part is brought near the inlet opening of the channel, thereby completely preventing the buckling of the flexible tube.

In a chucking attachment according to an embodiment of this invention, the flexible portion of the

chucking member is provided with a plurality of notches formed in the axial direction of said member. In another embodiment, the flexible portion of chucking member is progressively broadened toward the top in the flare or conical form. When the broadened top of the flexible portion of the chucking member is radially depressed by the fingers, the portion can pinch the fine flexible tube passing therethrough. In still another embodiment, not only the flexible portion of the chucking member is progressively broadened toward the top in the flare or conical form, but also the flexible portion and cylindrical portion are provided with a notch extending lengthwise throughout one side of the chucking member and communicating with the flexible tube passageway of the chucking member. Accordingly, the flexible tube can be inserted sideways into the chucking member through said notch.

It is accordingly an object of this invention to provide a chucking attachment of simple construction for insertion of a fine flexible tube into an endoscope which can be easily fitted to the endoscope and also enables the fine flexible tube to be taken into the endoscope without buckling.

Another object of this invention is to provide a chucking attachment capable of forcing the fine flexible tube into the channel of the endoscope reliably and quickly.

Other objects of this invention will be easily understood by reference to the description of the preferred embodiments and the drawings attached hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1 and 2 are lengthwise exploded views of the prior art endoscope showing the buckling of a fine flexible tube occurring near the inlet opening of the channel of the endoscope when said tube is taken into the channel;

FIG. 3 is a lengthwise exploded view of the prior art endoscope wherein the flexible tube is inserted into the channel of the endoscope with a core metal drawn into said tube;

FIG. 4 is a lengthwise exploded view of the prior art endoscope showing the steps of passing a flexible tube through the endoscope channel and inserting the forward end of the tube into the pancreatic duct to pour an opaque X-ray photographing fluid into said duct by means of a syringe;

FIG. 5 is a partly exploded view of a chucking attachment according to an embodiment of this invention, showing the step of inserting a fine flexible tube into the channel of an endoscope with the chucking attachment fitted to the inlet opening of the channel;

FIGS. 6 and 7 are oblique views of the chucking member of the chucking attachment according to another embodiment of the invention;

FIG. 8 is a partly exploded oblique view of a chucking attachment according to still another embodiment which consists of the chucking member of FIG. 7 and a guide member having a different shape from that of FIG. 5;

FIG. 9 is a partly exploded oblique view of a guide member and chucking member, when disassembled, which are shaped differently from those of the preceding embodiments so as to prevent the loosening of their mutual connection;

FIG. 10 is a partly exploded oblique view of a curved guide member and a curved chucking member, when

disassembled, which jointly constitute a chucking attachment according to a further embodiment of the invention; and

FIG. 11 is a partly exploded view of an entire endoscope apparatus, showing the condition in which the curved chucking attachment of FIG. 10 is attached to said apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 5, the body 11 of an endoscope has a projection 11a. Formed in the inner wall of the endoscope body 11 is a channel 12 whose inlet opening 12a is positioned in the projection 11a. FIG. 5 only shows part of the endoscope body 11 and the inlet opening 12a of the channel 12 including its neighborhood.

The inlet opening 12a of the channel 12 is provided with a cavity 13 having a larger diameter than the inner diameter of the channel 12 and screwed on the inside. A cylindrical guide member 14 screwed on the outside of the lower end is detachably fitted into the cavity 13. The guide member 14 has substantially the same inner diameter as the channel 12 and an axial line aligning with that of the channel 12. Accordingly, the channel 12 may be deemed to have a linear upward extension substantially corresponding to the length of the guide member 14 and consequently the actual inlet opening of the channel 12 is constituted by the upper inlet opening of the guide member 14.

Fitted into the guide member 14 is a chucking member 15 slidable in the axial direction of the guide member 14 in abutment against the inner wall of the guide member 14. This chucking member 15 enables, as later described, the fine flexible tube 16 to be smoothly conducted through the channel 12. The chucking member 15 is wholly formed of relatively hard plastic material, for example, polycarbonate resin. That lower end portion of the chucking member 15 which is received in the guide member 14 has its periphery protruded to form a flange-like projection 15a. This flange-like projection 15a slides along the inner wall of the guide member 14. On the other hand, the inner wall of the periphery of the upper open end of the guide member 14 is provided with a similarly flange-like projection 14a which is made engageable with the projection 15a of the chucking member 15 so as to prevent the chucking member 15 from slipping upward out of the guide member 14. When the chucking member 15 is pulled uppermost, both projections 14a and 15a are brought into engagement.

The substantially lower half of the chucking member 15 consists of a cylindrical portion 15b having an inner diameter slightly larger than the outer diameter of the flexible tube 16. On the other hand, the upper half portion of the chucking member 15 is provided with a plurality of notches 17 extending in the axial direction of the chucking member 15. The remaining separate band-like strips jointly constitute an elastically flexible portion 15c. The upper end of each of the band-like strips constituting the elastically flexible portion 15c is rounded outward to form a lug 15d. The elastically flexible band-like strips 15c of the chucking member 15 can be easily depressed by the fingers inwardly, namely, radially of the chucking member 15. Where, therefore, the elastically flexible band-like strips 15c are depressed by the fingers, as shown in FIG. 5, toward the peripheral surface of the flexible tube 16 inserted

into the chucking member 15, the tube 16 can be releasably pinched.

The elastically flexible band-like strips 15c of the chucking member 15 of the first embodiment which are defined by the intervening notches 17 may be formed of not only the aforesaid plastic material, but also thin strips of stainless steel.

As mentioned above, the chucking attachment of this invention consists of the guide member 14 and chucking member 15. Where, however, the endoscope body 11 has a considerably long projection 11a, or where, in case of the absence of said projection 11a, that part of the endoscope body 11 which is disposed near the inlet opening of the channel 12 is made relatively straight and has a proper hardness, then said projection 11a or another part of the channel may be substituted for a guide member, eliminating the necessity of providing a separate guide member 14 as shown in FIG. 5.

There will now be described the sequential steps of inserting the flexible tube 16 into the channel 12 of the endoscope 11. First, the guide member 14 is fitted to the chucking member 15 in advance to bring the chucking attachment to a readily applicable condition. Later, while the guide member 14 is fixed by being screwed into the cavity 13 of the endoscope body 11 or is left free, the forward end of the flexible tube 16 is introduced into the chucking attachment from the upper opening of the chucking member 15, namely, over the lugs 15d of the elastically flexible band-like strips 15c. The forward end of the flexible tube 16 is manually pushed through the chucking attachment up to the inlet opening 12a of the channel 12 and also beyond said inlet opening insofar as the insertion of the flexible tube can be effected by manual operation. When any further manual insertion is obstructed, then the chucking attachment is brought into play.

The chucking attachment is fixed to the endoscope body 11 by screwing the guide member 14 into the cavity 13 of said body 11. At this time, the chucking member 15 is taken into the innermost part of the guide member 14, namely, causing only the lugs 15d of the elastically flexible bandlike strips 15c to project above the guide member 14. The chucking member 15 is pulled upward by catching the lugs 15d by the fingers in slidable abutment against the flexible tube 16. FIG. 5 shows the chucking member 15 pulled upward.

The flexible tube 16 is pinched by the elastically flexible band-like strips 15c depressed by the fingers radially of the chucking member 15 and introduced into the guide member 14 together with said chucking member 15. While being thus inserted, the flexible tube 16 is firmly held straight by the cylindrical portion 15b and guide member 14. Therefore, the forward end of the flexible tube 16 smoothly advances without being subjected to buckling near the inlet opening of the endoscope channel 12, though the forward end may be encountered with a slight friction with the channel 12.

When the chucking member 15, together with the flexible tube 16, is brought deep into the guide member 14, then the flexible tube 16 is released from the pinch by the elastically flexible band-like strips 15c. Next, the lugs 15d are held by the fingers to pull up the chucking member 15. At this time, the forward end of the flexible tube 16 of course retains the position to which it was finally brought by the preceding insertion. When the elastically flexible band-like strips 15c of the pulled up chucking member 15 are manually made to pinch

the flexible tube 16 again, then said tube 16 is forced into the endoscope channel 12 for a prescribed distance, namely, to an extent corresponding to one vertical sliding stroke of the chucking member 15.

Repetition of the above-mentioned pinch and release of the flexible tube 16 by the chucking member 15 enables the tube 16 to be inserted stepwise into the endoscope channel 12 smoothly and forcefully without buckling, offering the advantage of rendering the tube 16 free from the tendency to be bent during insertion and prominently prolonging its effective life. Since the flexible tube 16 can be passed through the chucking attachment quickly and reliably each time, the period of the insertion cycle can be shortened. Moreover, the flexible tube 16 is not supported by a core metal received therein as is the case with the prior art but can be inserted into the endoscope channel in a state fully filled with an opaque X-ray photographing fluid, preventing the objectionable intrusion of air into the internal organ whose interior is going to be examined by X-ray photography.

The guide member 14 of the chucking attachment of this invention may be integrally formed with the endoscope body 11 instead of being provided separately. Further, the chucking member 15 may be formed into other modifications than the construction of FIG. 5. Some of these modifications are set forth in FIGS. 6 and 7.

The chucking member 115 of FIG. 6 consists, like that of FIG. 5, of a lower cylindrical portion 115b having substantially the same diameter as the flexible tube 16 so as to slide along the outer surface of the tube 16 and an upper half flexible portion 115c, which can be flexed radially of the chucking member 115 when depressed by the fingers. The chucking member 115 has a flexible tube passageway 118 extending through the cylindrical portion 115b and flexible portion 115c. According to the embodiment of FIG. 6, the flexible portion 115c is characterized in that it has a rectangular cross section and is formed into a flare shape. The longer side walls *a,a* are made thinner than the shorter side walls *b,b* disposed at right angles thereto. The inside of the facing longer side walls *a,a* of the flexible portion 115c partly constituting the flexible tube passageway 118 is very slightly spaced from the outer wall of the flexible tube 16 being inserted therein. On the other hand, the inside of the other facing shorter side walls *b,b* the flexible portion 115c partly constituting the flexible tube passageway 118 is increasingly spaced from the outer wall of the flexible tube 16 being inserted therein as viewed from the end at which the flexible portion 115c contacts the cylindrical portion 115b toward the upper opening of the flexible portion 115c. When, therefore, the facing longer side walls *a,a* of the flexible portion 115c are depressed inward or radially thereof by the fingers, then the flexible tube 16 can be easily pinched.

The chucking member 115 according to the embodiment of FIG. 6 may be prepared, like that of FIG. 5, from relatively hard plastic material, for example, polycarbonate resin. It is also possible to form the cylindrical portion 115b of metal and the flexible portion 115c of plastic material, or rubber such as butadiene acrylonitrile rubber.

The chucking member 115 according to the embodiment of FIG. 6 is operated in the same manner as that of FIG. 5 in inserting the flexible tube 16 into the endo-

scope channel 12. The facing thin longer side walls *a,a* of the flexible portion 115c not only easily pinches the flexible tube 16 when depressed by the fingers, but also is closely pressed against said tube 16. On the other hand, the other facing shorter side walls *b,b* are made thick and prevents the flexible portion 115c from being unduly distorted and in consequence suppresses the buckling of the flexible tube 16 when inserted into the endoscope channel 12.

There will now be described the chucking member 215 according to the embodiment of FIG. 7. This chucking member 215 is shaped substantially the same as that of FIG. 6, excepting that one side of the chucking member 215 of FIG. 7 is cut open lengthwise throughout so as to insert the flexible tube 16 sideways. Namely, a notch 219 is bored lengthwise throughout both the flexible portion 215c and cylindrical portion 215b constituting the chucking member 215 so as to insert the flexible tube 16 sideways into the chucking member 215, more facilitating said insertion than in the embodiments of FIGS. 5 and 6.

Where the chucking member 215 into which the tube 16 is inserted in advance is supposed to present some inconvenience in handling, then the chucking member 215 of FIG. 7 constructed as described above offers a prominent advantage of enabling the flexible member 16 to be inserted only when needed. Namely, the flexible tube 16 is first manually pushed directly into the endoscope channel 12 instead of being inserted into the chucking member 215. Where any further manual insertion is made impossible due to increasing friction between the tube 16 and channel 12, then it is advised to insert the tube 16 sideways into the tube passageway 218 of the chucking member 215 through the lengthwise extending notch 219. This makes the operation of inserting the tube 16 into the endoscope channel 12 very easy.

FIG. 8 shows the condition in which the chucking member of FIG. 7 is fitted into the guide member 114. This guide member 114 is shaped cylindrical like that of FIG. 5 with the same inner diameter but is different therefrom in that the guide member 114 of FIG. 8 has a notch 119 bored all along the length for communication with the flexible tube passageway provided in said guide member 114. When the chucking member 215 takes the indicated solid line position, the notch 219 of said chucking member 215 is aligned with the notch 119 of the guide member 114, enabling the flexible tube 16 to be inserted sideways into the tube passageway from one side of the chucking member 215 and guide member 114 through said notches 219, 119. Where the guide member 114 into which the flexible tube 16 is introduced in advance is considered to present some inconvenience in handling, then the flexible tube is manually inserted directly into the endoscope channel instead of being first taken into the guide member 114. When any further manual insertion is slightly obstructed due to increasing friction between the flexible tube 16 and channel 12, then the guide member 114 and chucking member 215 are fitted sideways to the flexible tube 16 through the aforesaid notches 219, 119. Thereafter, the guide member 114 is fixed to the endoscope body 11. Accordingly, the chucking member 215 of FIG. 8 has the advantage of prominently facilitating the insertion of the flexible tube 16 into the endoscope channel 12. Further, when the chucking member 215 is rotated about 90° as shown in the indi-

cated two dots-dash lines after the flexible tube 16 is inserted into the chucking member 215 and guide member 114, then the flexible tube 16 will be prevented from slipping out of the tube passageway and also from giving rise to buckling.

FIG. 9 shows another embodiment of this invention where the chucking attachment is provided with a device for preventing the chucking member 315 from coming off the guide member 314. According to this embodiment, two facing projections 314a are formed in the radial direction on the inner peripheral wall of the upper end of the guide member 314. On the other hand, a flange-like projection 315a formed on the bottom periphery of the chucking member 315 is provided with two facing notches 316 extending radially of said chucking member 315. These projections 314a and notches 316 are made engageable with each other to facilitate the insertion of the chucking member 315 into the guide member 314. After said insertion, the chucking member 315 is lifted just a little above the guide member 314 and slightly rotated so as to cause the unnotched portion of the flange-like projection 315a to be brought into contact with the aforesaid projections 314a. This procedure prevents the chucking member 315 from slipping out of the guide member 314. The withdrawal of the chucking member 315 out of the guide member 314 can be easily effected by rotating the chucking member 315 again so as to bring the notches 316 of the flange-like projection 315a of the chucking member 315 into alignment with the projections 314a of the guide member 314. The above-mentioned easy engagement and disengagement between the chucking member 315 and guide member 314 also facilitates the insertion of the flexible tube 16 therinto.

FIG. 10 shows still another embodiment of this invention wherein both guide member 414 and chucking member 415 being inserted therinto are bent with the same curvature. This is for the following reason. Since an attachment such as a photographic camera 400 is customarily fitted to the endoscope body 11 as shown in FIG. 11, the chucking attachment consisting of the guide member 414 and chucking member 415 should be prevented from striking against said attachment. In this case, it is demanded that particularly the guide member 414 be curved as shown in FIG. 11 in the direction in which the operation of the attachment is not obstructed. In consequence, the chucking member 415 also has to be bent with the same curvature as the guide member 414 so as to slide smoothly up and down there-through. If the curved chucking member 415 should rotate in the curved guide member 414 after inserted therinto, then the outer wall of the chucking member 415 will tightly abut against the inner wall of the guide member 414 and the resultant friction will prevent the easy slide of the chucking member 415 through the guide member 414. To avoid such difficulties, a projection 414a is formed on the inner peripheral wall of the upper end of the guide member 414, and a guide groove 416 is provided on the outer peripheral wall of the chucking member 415 all along the length. Therefore, the chucking member 415 should be inserted into the guide member 414 by bringing the projection 414a and groove 416 into engagement so as to suppress the possible rotation of the chucking member 415 in the guide member 414 and consequently admit of the smooth slide of the former through the latter.

The guide member 414 is generally preferred to consist of a metal pipe. That part of the channel 12 of the endoscope 11 which is positioned near its inlet opening is generally made of a metal pipe, and is often curved.

Therefore, said curved channel part may be used as the guide member 414. If, therefore, the chucking member 415 is originally designed for direct insertion into said curved channel part, then it will be unnecessary to provide the guide member 414 separately.

The fine flexible tube inserted into the endoscope channel by means of the chucking attachment of this invention broadly includes, as is usually the case, not only a tube for pouring an opaque X-ray photographing fluid and a catheter for drawing out a humor but also forceps for sampling part of the tissue of a living body.

What is claimed is:

1. In an endoscope having an outer tubular, flexible duct for insertion into the body, a fine flexible tube within said outer duct, and means for inserting said fine tube into said outer duct, the improvement in said means comprising, a cylindrical guide means disposed at the inlet opening of said outer duct to guide within a prescribed range said fine flexible tube as it is introduced into said duct; a cylindrical body slidably fitted into said guide means and having a rigid portion thereof slidably abutting against the outer wall of said fine flexible tube for guiding the same and a flexible portion thereof positioned on said cylindrical body and radially flexible when depressed by the fingers, thereby enabling pinching said fine flexible tube when inserted into the flexible portion of said cylindrical body, whereby said fine flexible tube is forced stepwise into the endoscope outer duct by repeatedly sliding said cylindrical body member through said guide means and also repeatedly causing said flexible portion of said body to pinch said fine flexible tube inserted therinto and to be released therefrom.

2. An apparatus according to claim 1 wherein said guide means has its bottom end detachably affixed to the inlet opening of the endoscope outer duct, the inner diameter of said guide means being substantially the same as that of said duct and forming therewith a continuous passageway.

3. An apparatus according to claim 1, wherein said cylindrical body within said guide means is wholly prepared from relatively hard synthetic resin.

4. An apparatus according to claim 1, wherein the flexible portion of said cylindrical body consists of a plurality of band-like strips defined by intervening notches cut out lengthwise of said body.

5. An apparatus according to claim 2, wherein an inwardly extending flange-like projection is formed at the upper end of the passageway of said guide means, and an outwardly extending flange-like projection is provided on the outer peripheral wall of the bottom end of said cylindrical body fitted into said guide means; engagement between the flange-like projection of said cylindrical body and the flange-like projection of said guide means preventing the bottom end of said cylindrical body from slipping out of said guide means.

6. An apparatus according to claim 1, wherein the flexible portion of said cylindrical body is progressively flared outwardly toward the end of the endoscope from which said fine flexible tube is inserted.

7. An apparatus according to claim 6, wherein a notch is cut out lengthwise throughout one side of both the flare-shaped flexible portion and the cylindrical

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portion of said cylindrical body, thereby enabling the fine flexible tube to be inserted sideways into the flexible tube passageway from one side thereof.

8. An apparatus according to claim 6, wherein said flare-shaped flexible portion has a substantially rectangular cross section; the two opposing longer side walls forming the rectangle being thinner than the two opposing shorter side walls, thereby enabling said thin longer side walls to be pinched when depressed by the fingers, and to engage the fine flexible tube within the flexible portion thereof.

9. An apparatus according to claim 2, wherein said guide means is metal; the rigid portion of said cylindrical body is also metal and the flexible portion thereof is rubber, said rigid portion and flexible portion being constructed in an integral body.

10. An apparatus according to claim 2, wherein a notch is formed lengthwise on one side of said guide

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means, thereby enabling the flexible tube to be inserted sideways into the guide member through the notch.

11. An apparatus according to claim 2, wherein two opposing projections are formed on the inner peripheral wall of the upper end of said guide means; a flange-like projection is provided on the outer peripheral wall of the bottom end of said cylindrical body, said flange-like projection being provided with two opposing notches extending radially of the cylindrical body, and engageable with the projections of the guide means.

12. An apparatus according to claim 2, wherein said guide means is curved and has a projection formed on the inner peripheral wall of its upper end; said cylindrical body within said guide means also being bent with the same curvature as the guide means and having a guide groove provided lengthwise throughout the outer wall so as to engage the projection of the guide means.

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