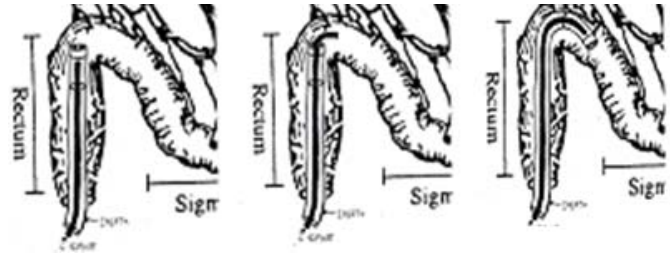


# A STIFFENABLE SHEATH FOR GENERAL ENDOSCOPY OR COLONOSCOPY

## **TECHNOLOGY OVERVIEW**

The invention improves the process of endoscopy and colonoscopy by reducing the mechanical trauma and perforation caused by the shaft of the endoscope/colonoscope. Endoscopy is a minimally invasive procedure that can pass through the body for diagnostic purposes, and minimizes the risks associated with open surgery. Colonoscopy can be viewed as an endoscopic procedure of the colon. The technology is an endoscope that has an exoskeleton structure of controllable stiffness and a highly flexible stem. The structure of the device consists of a series of small, rigid cylinders that allow it to bend and lock inside the colon. The device saves the patient from the pain caused by the colonoscope when it is guided from the anus to the end of the sigmoid colon. The stiffenable sheath guides the shaft of the colonoscope up to the end of sigmoid colon to avoid looping the shaft of the colonoscope. The adjoining diagram shows how the improved endoscope travels through the colon with alternating stiffening and relaxing stem movements.



## **POTENTIAL FIELDS OF USE**

The device can have extremely beneficial applications in the field of diagnostic and surgical medicine. It could facilitate and improve the mechanism of diagnosing several diseases such as colon cancer, intestine track infections and inflammatory bowel disease among others that require colonoscopy. Colonoscopy is of extreme discomfort to the patient and also carries the risks of perforating (tearing) the lining of the colon, splenic ruptures or bleeding. The technology not only mediates such risks drastically but also eliminates any risk that the patient would face on being given anesthesia. Several other diagnostic procedures involving the stomach, esophagus and the nose could also benefit due to the improvements provided by the technology. An example of this could be the removal of foreign objects from the stomach.

## **BENEFIT ANALYSIS**

The device provides several improvements over the available endoscopy devices available in the market:

- Simple and effective design of the device.
- Prevents the looping problems that are caused during endoscopy, and hinder its completion.
- Significantly reduces the pain borne by a patient during any kind of endoscopic procedure.
- Reduces/ eliminates the requirement of using anesthesia to control pain as it minimizes the discomfort faced by the patient. This in turn removes any possibility of an array of side effects caused by anesthesia that would otherwise be administered.
- Safe nature of the device prevents any side effects or discomfort due to its usage.

## **STAGE OF DEVELOPMENT**

The technology stands at an advanced stage of development. A prototype of the device was built and tested to validate its effectiveness. Several tests were performed to measure its performance under varying conditions. A simulation was performed for the validation of the mathematical model and the optimal design.

## **FUTURE DEVELOPMENT**

Future efforts will be applied towards considering the interaction between the endoscope and a sheath. Also, research is planned to uncover a more convenient locking mechanism, an optimal number of tendons and the various dimensions of the stiffenable sheaths for the different endoscopy.

## **LICENSING OPPORTUNITIES**

The patent application for this technology has been filed. Licensing opportunities are available.

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