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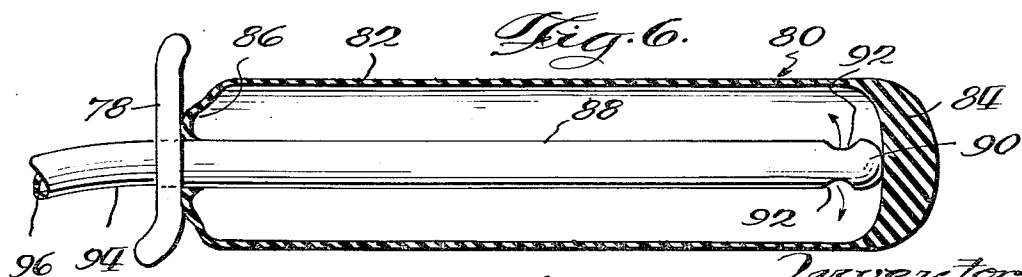
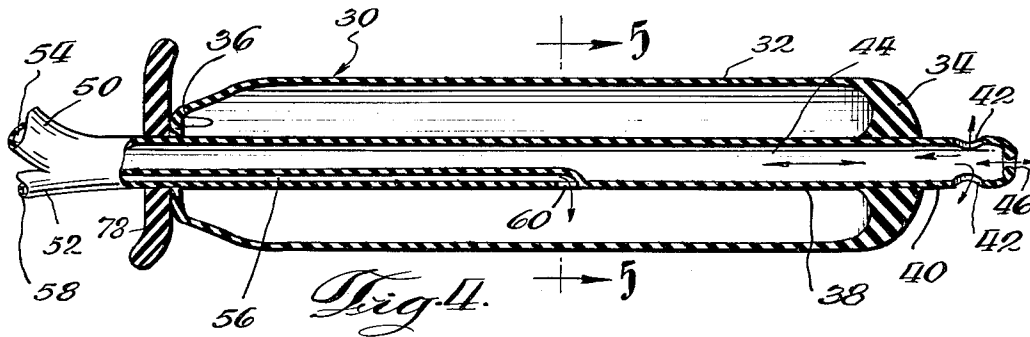
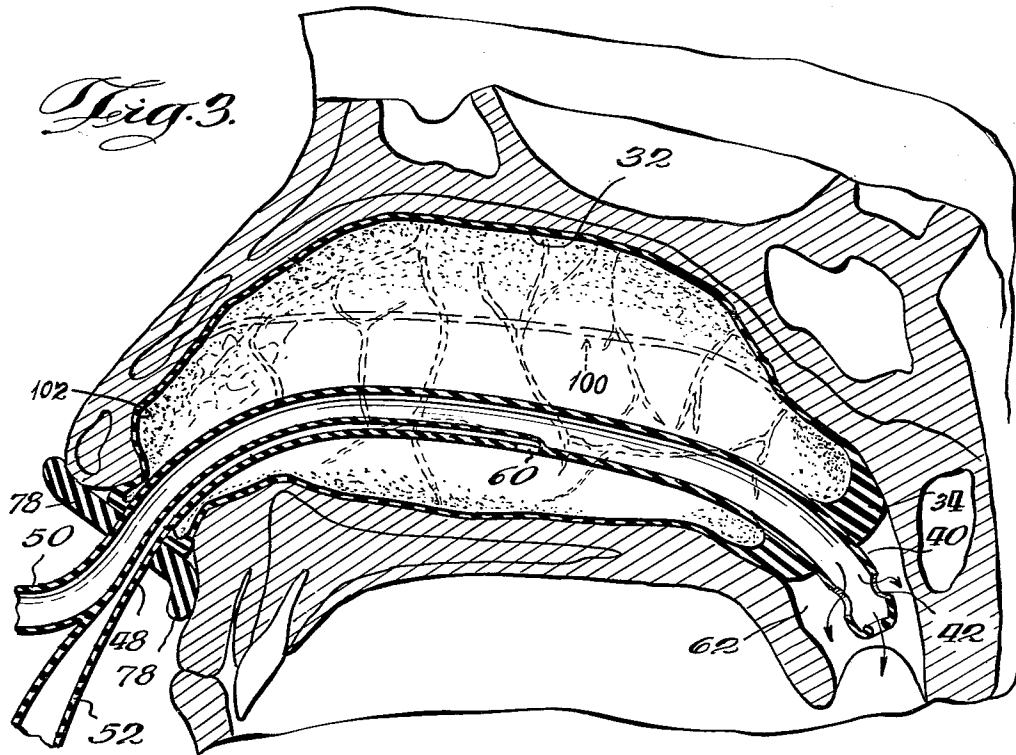
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NOSE PACKING DEVICE

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2 Sheets-Sheet 2



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## NOSE PACKING DEVICE

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2 Claims. (Cl. 128—325)

This invention relates generally to devices for controlling hemorrhaging and more particularly, relates to a unique nose packing device which includes an inflatable body adapted to be expanded in the nasal cavity to control epistaxis or nasal hemorrhage.

Epistaxis or nasal hemorrhaging which requires packing of the nose is quite a common phenomenon. Depending upon the cause and location of the bleeding, either posterior or anterior packing of the nasal cavity frequently is resorted to to control such nasal hemorrhaging. The general technique for packing a nasal cavity generally has been the same for many years. In the case of posterior nasal packing, a gauze or sponge plug secured to a catheter may be inserted through the anterior nares into the nasal cavity. The catheter is guided through the posterior choanae into the oral cavity and an end of the catheter is pulled out through the mouth. The plug is then drawn up against the posterior choanae. In the case of anterior nasal packing, it has been common to spread the anterior nares widely with a nasal speculum and insert the end of a strip of gauze and pack the nasal cavity by forcing the strip thereinto with a bayonet or angulated dressing forceps. The strip may be dry or impregnated with a suitable lubricant. Simpson's sponges also have been used instead of gauze strip.

The nose packing techniques and equipment heretofore used substantially universally have been unsatisfactory in many important respects. The degree of efficiency and success achieved in positioning the nose pack in the nasal cavity to exert sufficient pressure at the desired location to control bleeding has depended upon the skill and experience of the person administering the treatment. Notwithstanding, the initial pack has not always been successful in halting the nasal hemorrhaging and very often, repeated nose packs had to be applied before success was achieved. This, of course, was painful to the patient and could result in serious loss of blood. Such nose packs had to be removed periodically for cleansing of the nose and it was not uncommon to cause recurrence of the hemorrhaging by tearing or pulling away of scabs or scar tissue adhered to the gauze or sponge. The patient subject to such treatment has been put to considerable discomfort in addition to the normal discomfort occasioned during the period in which nose must remain packed. Further, such nose packing did not permit reduction in pressure exerted in the nose except by removing the nose pack.

In the case of heretofore conventional anterior and posterior packing of the nose, the patient has been unable to breath through the packed nasal cavity. Where both sides of the nose require packing, no respiratory channel through the nose has been available with its attendant disadvantages and inconvenience to the patient. Under circumstances where normal breathing through the oral cavity is impaired or hampered and both sides of the nose must be packed, the problem of supplying air or oxygen, as the case may be, to the patient is considerably complicated. Heretofore conventional techniques and equipment for nasal packing has only made the treatment of patients under these circumstances more difficult.

Accordingly, it is a principal object of the invention to provide a nose pack device of the character described which is characterized by a construction capable of substantially eliminating the disadvantages enumerated hereinabove.

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An important object of the invention is to provide a novel nose pack device of the character described which includes an expansible body or member which can be readily inserted into the nasal cavity through the anterior nares and inflated to substantially conform to the configuration of the nasal cavity whereby to exert pressure against the internal walls of the nasal cavity for controlling nasal hemorrhaging both as an anterior and posterior nasal packing.

Another important object of the invention is to provide a novel nose pack device of the character described which includes a respiratory conduit for breathing through the nasal cavity in which the device is operatively installed.

In view of the medical treatment intended to be administered by the nose pack device embodying the invention, it is necessary that the device be antiseptically clean. It is another object of the invention to provide a device of the character described which can be antiseptically cleansed readily and easily either prior to use thereof or which can be packaged in this condition available for immediate use.

Another object of the invention is to provide a nose pack device of the character described which is easily and readily positioned in the nasal cavity and which can be expanded under control over a range of pressures desired to press against the interior walls of the nasal cavity.

Another object of the invention is to provide a device of the character described which is very economical to manufacture, which can be used over and over again, which is strong and durable and which is simple to install and use so that the degree of skill and training heretofore required of personnel administering nose packs may be materially reduced.

The foregoing and other objects of the invention will become apparent from the ensuing description, in connection with which preferred embodiments of the invention have been described in detail and illustrated in the accompanying drawings. It is contemplated that minor variations in the size, arrangement, construction and proportion of the several parts thereof may occur to the skilled artisan without departing from the scope or sacrificing any of the advantages of the invention.

In the drawings where the same characters of reference have been employed to identify the same or equivalent parts throughout the several figures thereof:

FIG. 1 is a fragmentary diagrammatical view of a human head with portions broken away to show a nasal cavity and an anterior nasal pack of the heretofore conventional type.

FIG. 2 is an enlarged fragmentary diagrammatical elevational view of a human head with portions broken away to illustrate a nasal cavity and a preferred embodiment of the nose pack device embodying the invention on the interior of the nasal cavity in deflated condition and connected to a source of fluid for inflating same.

FIG. 3 is a fragmentary diagrammatical view similar to FIG. 2, but enlarged, and showing the nose pack device expanded on the interior of the nasal cavity.

FIG. 4 is a longitudinal sectional view taken through the nose pack device embodying the invention.

FIG. 5 is a sectional view taken through said device along the line 5—5 of FIG. 4 and in the direction indicated.

FIG. 6 is a longitudinal sectional view taken through a modified form of the invention which does not have a respiratory conduit.

Referring now to the drawings, there is shown in FIG. 1 a nose pack 20 of heretofore conventional construction. The nose pack 20 is comprised of a strip 21 of gauze which may be dry or impregnated with a suitable lubricant, such as petrolatum. As illustrated, the gauze strip

has been inserted into the nasal cavity 22 of a head 24 to form an anterior nasal pack consisting of folded over layers of the strip which can exert an outward pressure against interior wall portions of the nasal cavity at their points of contact therewith. The type of pack is usually applied by spreading the anterior nares of the nose 26 and folding the strip 20 into the nasal cavity by means of suitable forceps. The strip 20 usually is packaged in a jar which is held inverted opposite and on a level with the patient's eyes during the packing procedure. It will be appreciated that this manner of nose packing requires great skill and experience and often entails considerable trial and error on the part of the medical personnel making the nose pack in order to properly position the folded gauze layers with respect to the area of bleeding. This is further emphasized by the illustration of the numerous small blood vessels 28 of the nose, the rupture of which usually cause the bleeding. In addition, posterior portions of the nasal cavity 22 are difficult to pack successfully. It will be appreciated that forcing the gauze strip 21 into the nasal cavity while the nares are maintained spread apart is painful and inconvenient to the patient. Replacement of the nose pack for any reason requires the patient to go through the same painful experience.

Referring to FIG. 4, one embodiment of the nose pack device constructed in accordance with the invention is designated generally by the reference character 30. The device is of the type that permits the patient to breathe through the nasal cavity in which installed. Said device includes an expandable vessel or bag 32 of generally cylindrical configuration in its normal deflated condition. The vessel or bag 32 is closed at its opposite ends by transverse walls 34 and 36 respectively. Considering the manner in which the device is used, the wall 34 comprises the leading or forward end wall and the wall 36 comprises the trailing or rear end wall of the vessel. Preferably, the vessel or bag is made of a strong rubber or rubber-like material of the type and gauze used for surgical gloves, for instance, this material being easily sterilized by conventional means used in hospitals. This material also permits convenient collapsing of the bag 32 so that same can be easily inserted into the nasal cavity 22.

Extending longitudinally through the vessel 32 is a continuous, flexible hollow tube or conduit 38 which, likewise, preferably is formed of rubber or rubber-like material. The end segment 40 of said tube 38 extends outwardly through the end wall 34 and is rigidly secured to said end wall by any suitable means, such as, high-strength adhesive, sutures or by welding. The protruding end segment 40 has a plurality of perforations 42 in the circumferential wall thereof which communicate with the axial passageway 44 of said tube. Extremity 46 of said end segment may be open. Also, the extremity 46 preferably is rounded or tapered to prevent damage to the mucous membrane, nerves and/or blood vessels when said end segment 40 is in the nasal cavity. To assure a rupture-proof connection of the end segment 40 with the transverse end wall 34, the end wall 34 is thickened substantially as will be apparent from a comparison thereof with the opposite end wall 36. The thickening of end wall 34 serves an additional function as well.

At its opposite end, the conduit 38 extends outwardly through the end wall 36 to provide a protruding segment 48 which terminates in a pair of branches 50 and 52 respectively. The branch 50 comprises a conduit connecting with the axial passageway 44 and includes an inlet 54 which permits air from exterior of the vessel 32 to be passed through the tube 38 and out through the passageways 42 and open extremity 46 of the end segment 40 without interference from the vessel 32. There thus is provided an unobstructed conduit for air through the vessel 32 which can function as a respiratory conduit for the device 30.

The branch 52 provides a second conduit connecting with a second passageway 56 in the circumferential wall

of the tube 38 substantially parallel with and independent of the axial passageway 44. The branch 52 has an inlet 58 exterior of the vessel 32 and the passageway 56 has a discharge outlet 60 on the interior of said vessel. The branch 52 and the passageway 56 together with the inlet 58 and outlet 60 respectively cooperate to provide a conduit for discharging a fluid, such as air, into the vessel 32 to expand or inflate the same. Although the separated passageway 44 and passageway 56 has been illustrated as provided in the same tube 38, it will be appreciated that other structural means may be utilized to permit separate inflation or expansion of the vessel 32 and still provide a respiratory conduit through the vessel. Thus, a separate inlet may be provided on the vessel 32 independent of the tube 38 for inflating the bag 32.

Referring to FIG. 2, the device 30 is shown positioned in a nasal cavity 22 in a deflated condition. This is accomplished by inserting the extremity 46 of segment 40 into the nasal cavity pass the anterior nares of the nose which may have been spread apart using a conventional nasal speculum. No forceps are required since the tube 38 may be manipulated much like a catheter and tube 38 is flexible so as to bend readily to follow the normal front to back curvature of the nasal cavity. The bag 32 is readily collapsed around the tube 38 to facilitate passage through the nares. Such medical techniques as sterilizing the device 30 and coating the outer surfaces of the vessel 32 with a suitable lubricant may be resorted to prior to positioning of the device 30 in the nasal cavity. It will be noted that the end segment 40 is located in the pharyngeal channel 62 at the posterior of the nasal cavity while the end wall 34 is engaged against the circumferential walls of the channel 62. The outer diameter of the end segment 40 and the vessel 32 respectively are selected to permit this relationship to be realized when the device is installed in the nose cavity 22. Also, the tube 38 is suitable flexible to permit bending thereof to achieve such positioning of end segment 40.

Referring to FIGS. 3 and 2, the device 30 is illustrated in expanded or inflated condition in FIG. 3. Reference may be had to FIG. 2 to illustrate diagrammatically various expedients which may be utilized to expand the vessel 32 to the condition thereof shown in FIG. 3. A conventional syringe 64 may be connected to the inlet 58 and inward movement of the piston 66 thereof in the direction of the arrow 67 utilized to force air through the passageway 56 into the vessel 32 to inflate the same. The conventional syringe has a volumetric scale 68 which can be utilized to gauge the pressure of air in the expanded vessel 32.

Another expedient which may be used to expand vessel 32 is the conventional manometer bulb attachment designated generally 70 which includes a pressure gauge 72 and a hollow rubber bulb or ball 74 which can be compressed manually. An auxiliary section 76 of flexible conduit may be used to connect the manometer attachment 70 to the inlet 58 as shown in broken outline.

After the vessel 32 is inflated, the means for expanding the same may be detached from the conduit branch 52, the branch 52 clamped or folded over to prevent escape of air therethrough and taped to side of the patient's face. If the internal pressure of the vessel 32 is too great for comfort, it is possible to release air therefrom through the conduit branch 52 while still observing whether bleeding has been controlled. As seen in FIG. 3, the thickened wall 34 will not be permitted to expand very much as compared to the thinner circumferential walls of the vessel 32 so as possibly to cover the openings 42, but will be pressed against the wall surrounding the channel 62. The circumferential wall of the vessel 32 will expand readily to follow the contours of the nasal cavity and exert an outward pressure there against effective to control nasal hemorrhaging. The flexibility of the tube 38 permits bending thereof along the length thereof so

that wall of vessel 32 can so readily conform to the peripheral wall of cavity 22.

To prevent inward movement of the vessel 32 into the nasal cavity, a stop member 78 may be mounted on the segment 48 and secured also to the end wall 36 which will not interfere with passage of air through the conduit branches 50 and 52. The member 78 may comprise a plastic wafer or disc suitably perforated to permit the segment 48 to be extended therethrough and of suitable diameter greater than the anterior opening of the nasal cavity 22.

Referring to FIG. 6, a modified form of the nose pack device embodying the invention is identified generally by the reference character 80. The device 80 includes an expandible vessel or bag 82 similar to vessel 32. The leading end wall 84 may be thickened as compared to the trailing or opposite end wall 86 of the vessel although this is not necessary. An elongate tube 88 is extended through the end wall 86 and is sufficiently long to reach adjacent the end wall 84 on the interior of the vessel. The inner end 90 of the tube is perforated as seen at 92. The tube 88 has a segment 94 exterior of the end wall 86 providing an inlet 96 for forcing air into the vessel 82 and for supporting a stop member 78. In this embodiment of the invention, when the device 80 is expanded in the nasal cavity, no respiratory conduit is provided through the expanded vessel. The tube 88 may be manipulated like a catheter for positioning the device 80 in a nasal cavity prior to inflating the same.

Although the nose pack device has been described and illustrated as being fully inflated to conform entirely with the internal cavity 22, it should be appreciated that in some instances, this may not be necessary. In cases of a nose bleed from anterior portions of the nasal cavity, it may be possible to curtail the bleeding by partial inflation of the bag 32 as illustrated in broken outline 100. For instance, nose bleed the source of which is in the anterior cavity 102 can be controlled by partial inflation of the device. The amount of fluid introduced into the bag 32 to expand the same is readily controlled by any one of the means discussed and illustrated and removal of the nose pack device is not required as in the case of pack 20 when successful control of the hemorrhaging has not been achieved initially.

It will be appreciated that the size of the devices 30 or 80 may be varied by varying the length and diameter of the expansible vessel or bag thereof. Thus, the nose pack devices embodying the invention may be manufactured in a plurality of different sizes for use both for adults and children. Same may be packaged already sterilized for immediate use, if desired, or may be sterilized prior to use thereof by the medical personnel. The material from which the vessel 32 or 82 is made should be strong so

that it will not be subject to blow-out and will not leak air therethrough but still permit suitable stretching thereof when the bag 32 is inflated. The joint between the tube and the end wall of the vessel through which same is passed must be strong and substantially rupture-proof.

It is believed that the invention has been described in sufficient detail to enable the skilled artisan to understand and practice the same. The invention has been pointed out in the claims appended hereto in language intended to be liberally construed commensurate with the advance in the arts and sciences contributed thereby.

What it is desired to secure by Letters Patent is:

1. A nose pack device adapted to be inserted into a nasal cavity and thereafter expanded for halting nasal hemorrhaging comprising, an expansible bag having first and second transverse end walls, the second transverse end wall adapted to be located within the nasal cavity, a single flexible tube extending entirely through the bag and having an extension protruding past said second end wall, said tube being divided into a pair of conduit portions each having a passageway therethrough, the passageway of one conduit portion having a discharge end in the interior of the bag and an inlet end exterior of the first end wall for introducing a fluid to expand the bag in the nasal cavity, the passageway of the second conduit portion having an inlet exterior of said first end wall and an outlet exterior of the second end wall and formed in said extension, the second end wall being thickened simultaneously to support said extension spaced from the walls of the nasal cavity and seal the interior of the nasal cavity whereby respiratory activity is permitted only through the second conduit portion in the expanded condition of the device in said nasal cavity, said flexible tube having a multi-branched end portion exterior of the first end wall, one branch being a part of said first conduit portion and the second branch being a part of the second conduit portion, said one branch comprising the inlet end of the first conduit portion and the second branch comprising the inlet end of the second conduit portion.

2. A device as described in claim 1 in which a wafer stop member is supported on the branches juxtaposed said first end wall for limiting movement of the first end wall into the nasal cavity when the bag is expanded.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |          |               |
|-----------|----------|---------------|
| 1,413,789 | Schaff   | Apr. 25, 1922 |
| 2,265,387 | McMillin | Dec. 9, 1941  |
| 2,691,985 | Newson   | Oct. 19, 1954 |
| 2,936,760 | Gants    | May 17, 1960  |

##### FOREIGN PATENTS

|         |       |               |
|---------|-------|---------------|
| 334,404 | Italy | Jan. 25, 1936 |
|---------|-------|---------------|