

July 20, 1965

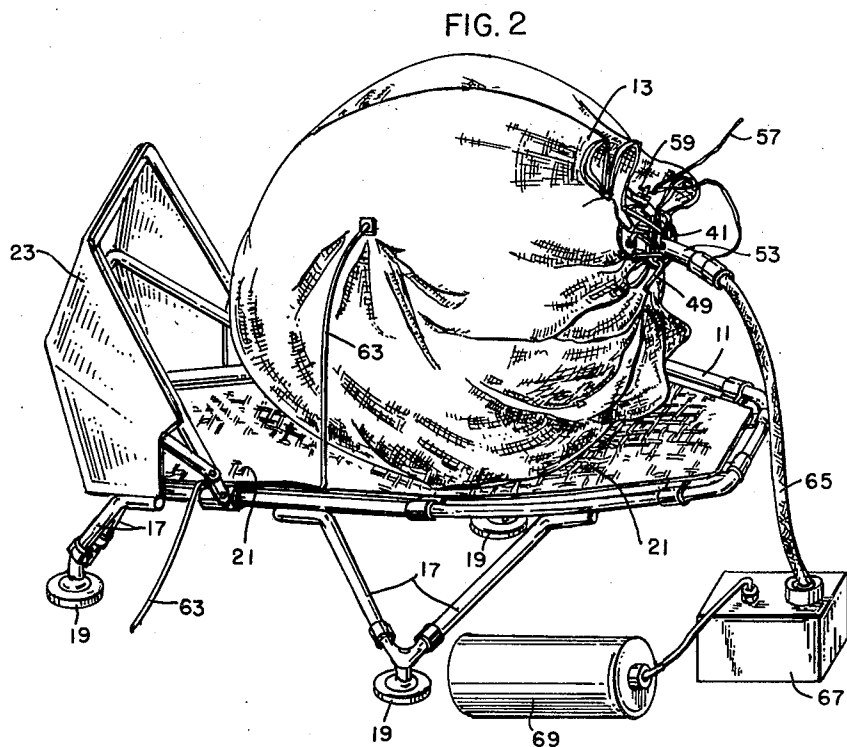
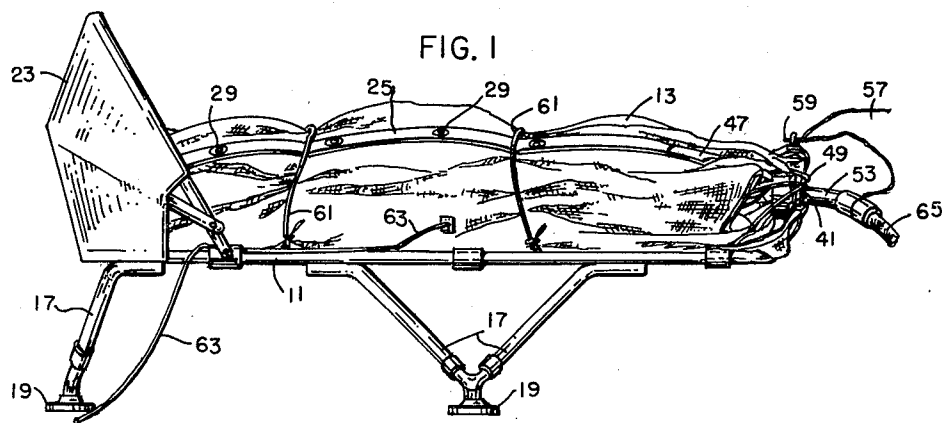
D. G. EYRE ET AL

3,195,835

BALLOON LAUNCHING APPARATUS

Filed June 3, 1964

2 Sheets-Sheet 1



INVENTORS,
DAVID G. EYRE
MOSES B. SHARENOW

BY: *Harry M. Saragovitz,*
Edward J. Kelly,
Herbert Durl,
Julian C. Keppler ATTORNEYS.

July 20, 1965

D. G. EYRE ETAL

3,195,835

BALLOON LAUNCHING APPARATUS

Filed June 3, 1964

2 Sheets-Sheet 2

FIG. 3

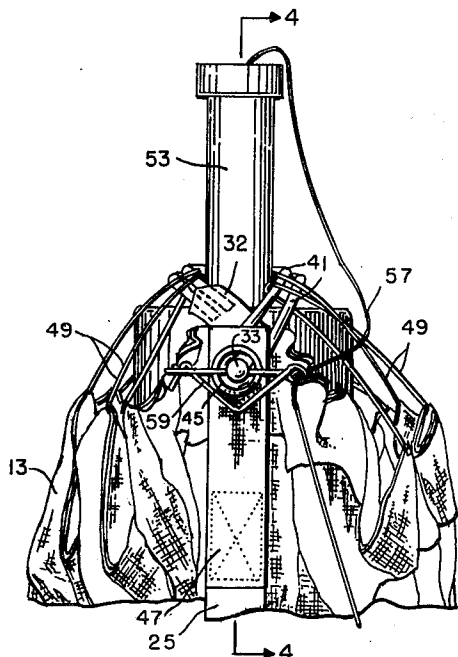


FIG. 4

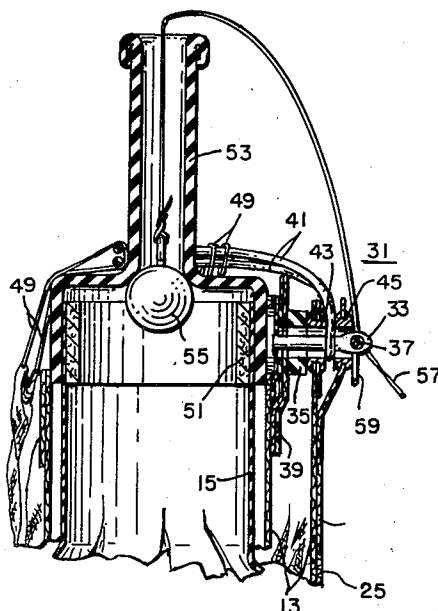


FIG. 5

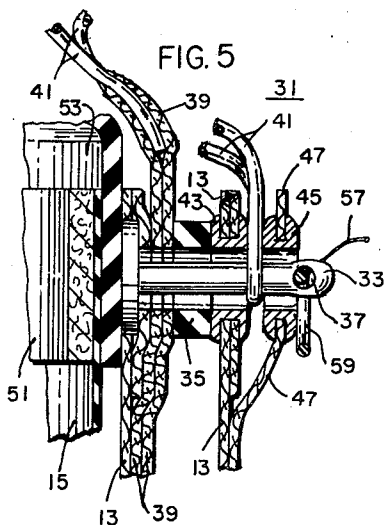
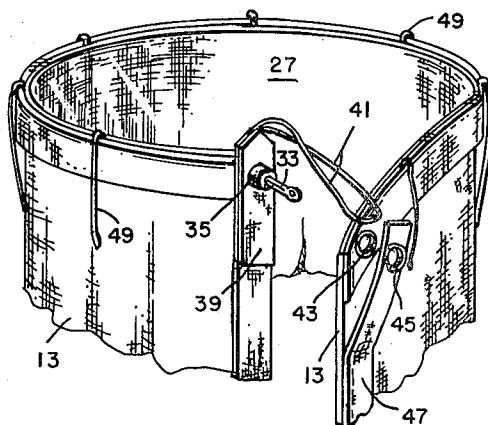


FIG. 6



INVENTORS,
DAVID G. EYRE
MOSES B. SHARENOW

BY: *Harry M. Saragovitz,*
Edward J. Kelly,
Herbert Berl,
Julian C. Keppler ATTORNEYS.

1

3,195,835

BALLOON LAUNCHING APPARATUS

David G. Eyre, Long Branch, and Moses B. Sharenow,
Asbury Park, N.J., assignors to the United States of
America as represented by the Secretary of the Army
Filed June 3, 1964, Ser. No. 372,431
4 Claims. (Cl. 244—31)

(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

The present invention relates to an apparatus for launching balloons and more particularly to the launching of balloons that carry meteorological test equipments.

Balloons of the kind referred to above are conventionally made of extremely thin (in the nature of .001") synthetics, such as neoprene, etc. It is readily apparent that such balloons could not be inflated and launched from ground terrain because of the possibility of damage to the balloon. It was also found that such possibility of damage to the balloon rapidly increased when attempts were made to launch a balloon in the manner under adverse atmospheric conditions, i.e., under high wind velocities, sand storms, or in heavy rains.

In an attempt to provide safer launching conditions, several elaborate and expensive launching systems have been devised and suggested in the past. At times such systems included a canopy or cover for the balloon to protect the balloon during its inflation and initial launching. Despite the utilization of experienced personnel, considerable consumption of time and use of elaborate equipments, it was found that a considerable number of failures occurred with the existent equipments and systems.

It is a principal object of this invention to provide a new and novel system and apparatus for launching meteorological type balloons, that are of a size up to about 10 feet in diameter, which eliminates the difficulties and shortcomings of systems now in use.

Other objects of the invention are to provide a launching device that is considerably lighter in weight than conventional systems; to provide a device that can be collapsed for ease of carriage and shipment; to provide a device that can be operated in the most adverse of atmospheric conditions; to provide a device that can be operated by one man with a minimum of operational training; to provide a launching device including a novel canopy which makes use of a simple release mechanism to release the balloon for instantaneous launching; and to provide a device that has a minimum of operating parts thus reducing the possibility of any malfunctions.

Other objects and features of the invention reside in the structural details of the simple release means for allowing release of the balloon, and the means for securely holding the balloon prior to its release.

To the accomplishment of the foregoing and related ends, this invention then comprises the features herein-after fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

This invention will be described with reference to the drawings in which corresponding numerals refer to the same parts and in which:

FIG. 1 is an elevational view of the launching device, deflated balloon and canopy prior to the inflation of the balloon;

FIG. 2 is a view in perspective similar to FIG. 1 and showing the balloon inflated within the canopy;

FIG. 3 is an enlarged fragmentary side view showing

2

the nozzle of the balloon and the manner in which it is contained in the end of the canopy;

FIG. 4 is a sectional view, similar to FIG. 3 and taken on the line 4—4 thereof;

FIG. 5 is a detail cross-sectional view of the locking and releasing portion of the canopy; and

FIG. 6 is a perspective view showing a portion of the locking means of the canopy.

Reference is made to the drawings, particularly FIGS. 1 and 2 which show the general assembly of the launching device which basically includes a canopy and balloon support 11, a canopy 13 and a balloon 15 (see FIG. 4) contained within the canopy 13.

The support 11 is essentially in the form of a trampoline made of light weight material such as tubular aluminum sections that can be assembled to any desired size. Legs 17 are provided for the framework which terminate in rollers or disks 19 that permit easy movement of the support from one location to another. Included within the framework is a platform 21 made of open-work nylon or like material which has been antistatic treated to minimize electrostatic charge buildup. The support 11 further includes an upright windscreen 23 which extends perpendicular from the platform and serves to reduce the onrush of high velocity winds while the balloon is being inflated.

The balloons that can be successfully protected and launched from the launching device herein described are generally, though not limited thereto, of the type that are used in meteorological research and of a range in size from 110 to 300 cubic feet at sea level. Since such balloons are made of extremely thin synthetics (.001" thick), inflation and launching in extremely high winds or other adverse conditions often result in damage to the balloon. Accordingly, the use of the launching platform 11 forms an important factor in the successful launching of such type balloons.

The novel and unique arrangement and construction of the canopy 13 is an important feature of the present invention, and reference is made to the several figures of the drawings showing the details thereof. The canopy is made of an antistatic treated light weight fabric and has an elongated continuous opening 25 which extends from adjacent the top of the canopy, which is the left end as viewed in FIG. 1, to the open end of the canopy designated as 27 (FIG. 6). The deflated balloon 15 is inserted within the canopy through the opening 25, and after such insertion the opening is closed by an appropriate means such as a zipper or snap fasteners such as shown at 29. Such fastening means extend substantially to the open end of the canopy, designated as 27, where another type of lock and release means, designated generally as 31 is provided. The lock and release means 31 includes a stud 33 confined in a resilient bumper 35 and secured to the outer peripheral edge of the canopy at the opening 27. The stud 33 is provided with an eye 37 adjacent its end. For providing rigidity to the stud 33, a layer of stiffening fabrics 39 is sewed to the edge of canopy as seen in FIG. 6. Also secured beneath the fabric layer 39 is a cord loop 41, the function of which will be hereinafter described. Also included in the locking means are a pair of metal eyelets 43, 45, wherein eyelet 43 is secured to the other peripheral edge of the canopy and the eyelet 45 is confined in a strap 47 which is sewed or otherwise secured at its lower end to the body of the canopy edge at the opening 25.

Extending about the inner periphery of the canopy 13 are a series of loop-like ties 49 which forms part of and operates in conjunction with the means 31 for confining the balloon as it is being inflated, and to allow for release of the balloon when desired.

In FIG. 4 there is shown a fragmentary view of the balloon 15 which includes a rigid circular ring 51 of stiff cardboard or the like confined in the base portion of the balloon. The base portion of the balloon is fabricated from a substantially thick rubber or synthetic so that no damage can be imparted to the balloon at that end of the balloon where the locking means 31 functions. The base portion of the balloon terminates in a reduced diameter neck portion 53. Confined within the balloon is a ball valve 55, of a diameter slightly larger than the neck portion 53, and to which is secured a train line 57. The ball valve serves as a seal to prevent any escape of gas from the balloon after its inflation. A pin 59 is also secured to the train line 57, generally in the form of a releasable cotter pin and of a diameter capable of being loosely insertable through the eye 37 of stud 33.

For holding down the canopy and the balloon during inflation, there are provided pairs of lanyard like lines, one of which is shown at 63. One end of each line 63 is secured to the outer surface of the canopy, then looped through the support 11 to a remote location where the line can be payed out as the balloon is inflated. There are also provided a pair of tie down straps 61 which restrain the balloon in its semi-flaccid condition to prevent high winds from "piling" up the balloon in the downwind end of the canopy. The ends of the straps 61 are affixed to the framework of the support 11 and means are provided to let out or ease the straps 61 as the balloon is being inflated.

The manner in which the device herein described is used as a means for launching a balloon is as follows. With the canopy 13 in place as shown in FIG. 1, the deflated balloon 15 is positioned within the canopy with the neck 53 confined within the canopy. The loop 41 is then first threaded through each and all of the ties 49 to effect a "bunching" (see FIG. 3) of all of the ties. The loop 41 is then made secure in the following manner. The adjacent sides of the canopy are brought together and the eyelet 43 is inserted over the stud 33. At the same time the operator reaches into the canopy and brings the neck 53 of the balloon outwardly through the opening formed by the "bunched" ties 49. The loop 41 now surrounding the neck of the balloon is placed below the eyelet 43 and the eyelet 45 of the resilient strap 47 is similarly placed over the stud 33. The pin 59 is then placed through the eye 37 of the stud 33. The thicknesses of the strap 47 and the canopy at the eyelet 43 are such that a slight compression is sustained by the resilient bumper 35 when the pin 59 is inserted through the eye of the stud 33.

The balloon is now ready for inflation which is accomplished through the tank 69, a metering device 67 and hose 65. As the balloon 15 is inflated, along with the canopy 13, the lanyard line 63 is payed out along with the straps 61 if needed, thereby allowing for the normal unrestrained inflation of the balloon and at the same time securely holding the canopy and balloon in position on the support 11. When the balloon is inflated to its desired volume, the gas flow is cut off and the gas hose 65 is disconnected from the neck of the balloon. The ball valve 55 is then pulled into the neck 53 of the balloon. Since the ball valve is of slightly larger diameter than the neck of the balloon it becomes tightly wedged therein to prevent the escape of any gas from the body of the balloon. From a remote distance, even as far as 75-100 feet, the train line is pulled thereby drawing the pin 59 from its position in the eye 37 of the stud 33. As the pin is released, the strap 47 will fall open allowing the cord loop to become disengaged as shown in FIG. 6. At the same

time the ties 49 will fall free and the normal thrust of the inflated balloon will effect a complete opening of the end of the canopy allowing the balloon to emerge from within the canopy into the atmosphere.

It is apparent that modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

What is claimed is:

1. A balloon launching system comprising in combination a support for said balloon during its inflation, and a pliable expansion canopy that is secured to said support and adapted to enshroud said balloon, said canopy having an elongated opening throughout substantially the length of said canopy to one end thereof through which said balloon can be inserted while deflated, said canopy further including a plurality of looped ties spaced about the open peripheral edge of said canopy and a threading loop also secured at the peripheral edge thereof, said ties and threading loop forming part of a means for confining said balloon while it is being inflated and for releasing said balloon after its inflation.

2. A balloon launching system comprising in combination a support for said balloon, and a canopy secured to said support that enshrouds said balloon during its inflation, said canopy having an elongated opening throughout substantially the length of said canopy to one end thereof thereby forming a pair of opposing mating flap portions, said canopy further including a plurality of looped ties spaced about its open peripheral edge, a threading loop secured at the end of one of said flap portions, a stud also secured to said same flap portions as the threading loop over which said loop can be engaged, an eyelet opening in the other of said flaps, a strap secured at one end to said canopy and having an eyelet opening at its other end in register with said first eyelet and wherein both of said eyelet openings are adapted to be engaged over said stud, and a plurality of looped ties spaced about the open peripheral edge of said canopy and through which said threading loop can be threaded to form an opening through which the neck portion of said balloon can be inserted whereby when said threading loop, with the looped ties held thereby, is confined beneath the said stud between the outer flap of said canopy and the strap engaged on said stud, the balloon will be restrained in said canopy.

3. A balloon launching system of the kind set forth in claim 2 and further including means for effecting the release of said threading loop from its engaged position on said stud.

4. A balloon launching system of the kind set forth in claim 2 and further including an eye in said stud and a pin engageable in said eye for confining said flaps of the canopy, the strap affixed to said canopy and the threading loop whereby when said pin is disengaged the threading loop and the ties within said loop will fall free to release the balloon.

References Cited by the Examiner

UNITED STATES PATENTS

2,432,375	12/47	Bowles	244-139
3,063,657	11/62	Coester	244-31
3,093,351	6/63	Ney et al.	244-98

MILTON BUCHLER, *Primary Examiner.*

FERGUS S. MIDDLETON, *Examiner.*