No. 832,936. PATENTED OCT. 9, 1906.

A. M. VAUGHAN.

FRAME FOR FILTER PAPERS.

APPLICATION FILED JAN. 18, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

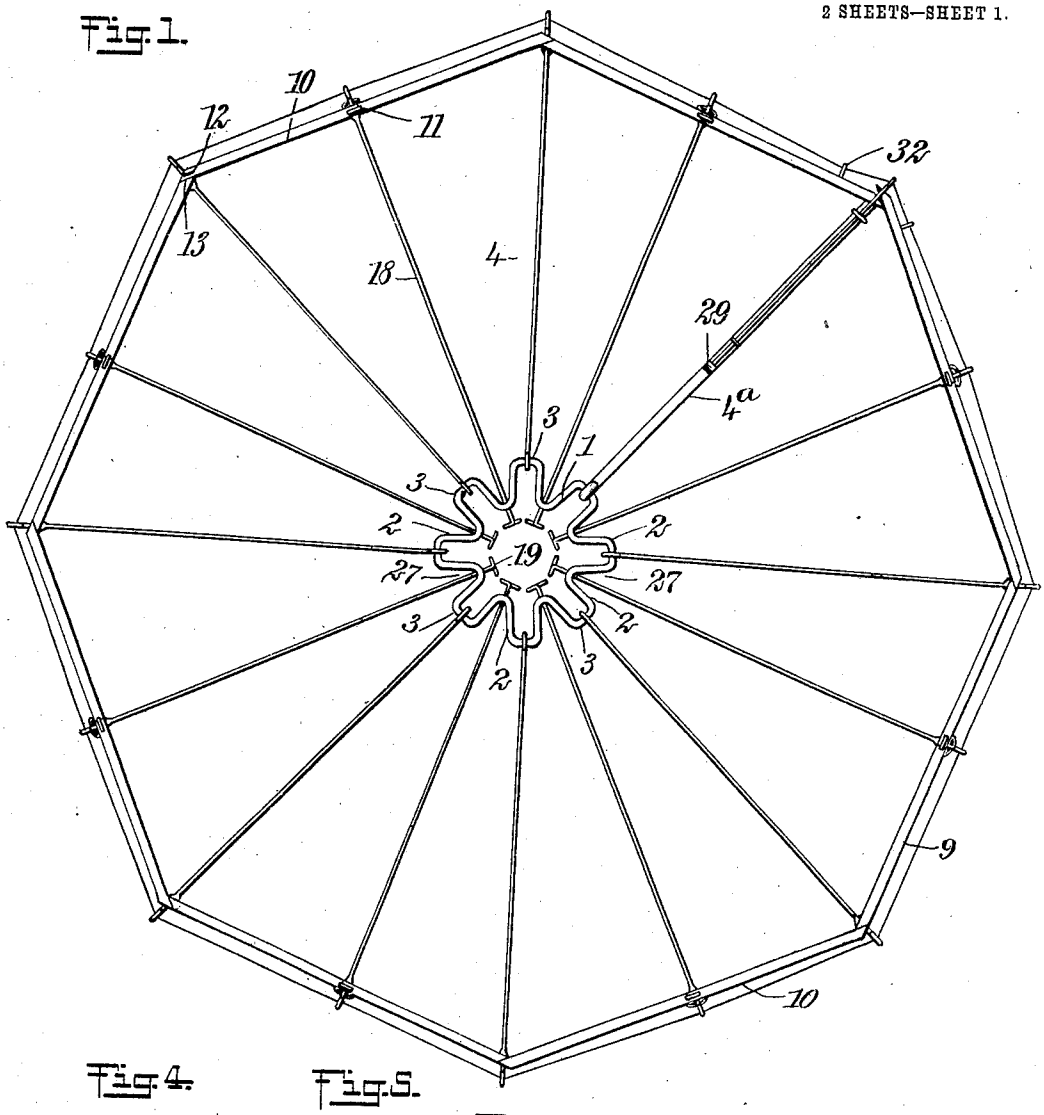


Fig. 4.

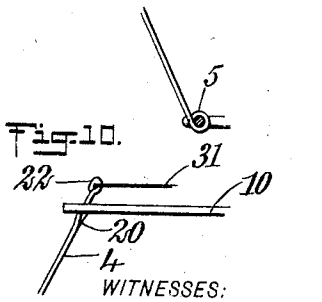


Fig. 10.

Fig. 5.

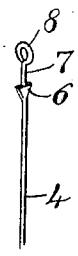


Fig. 6.



Fig. 9.

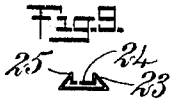


Fig. 7.

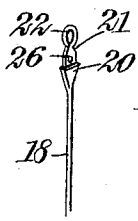
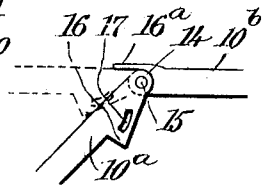


Fig. 8.



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2 SHEETS—SHEET 2.

Fig. 2.

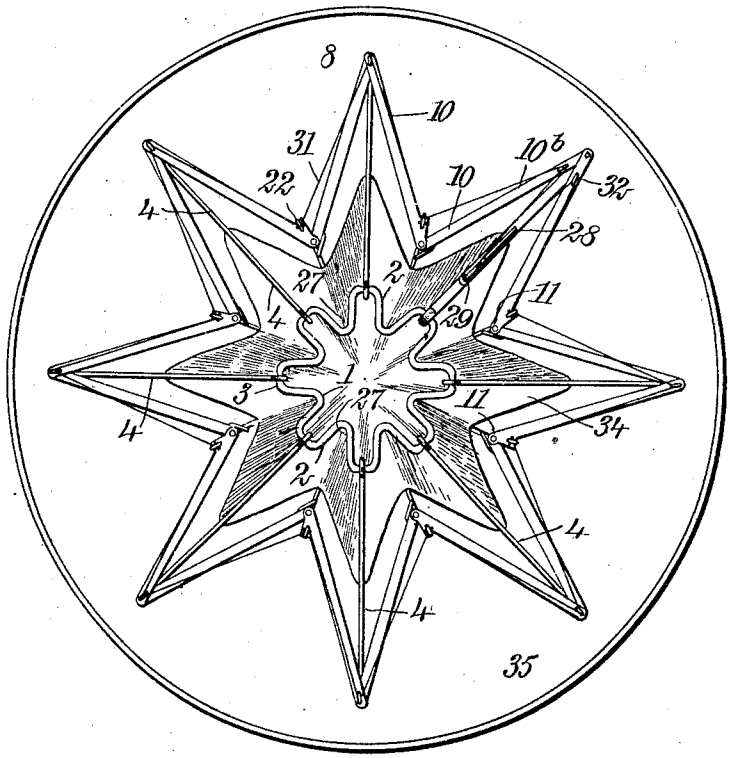
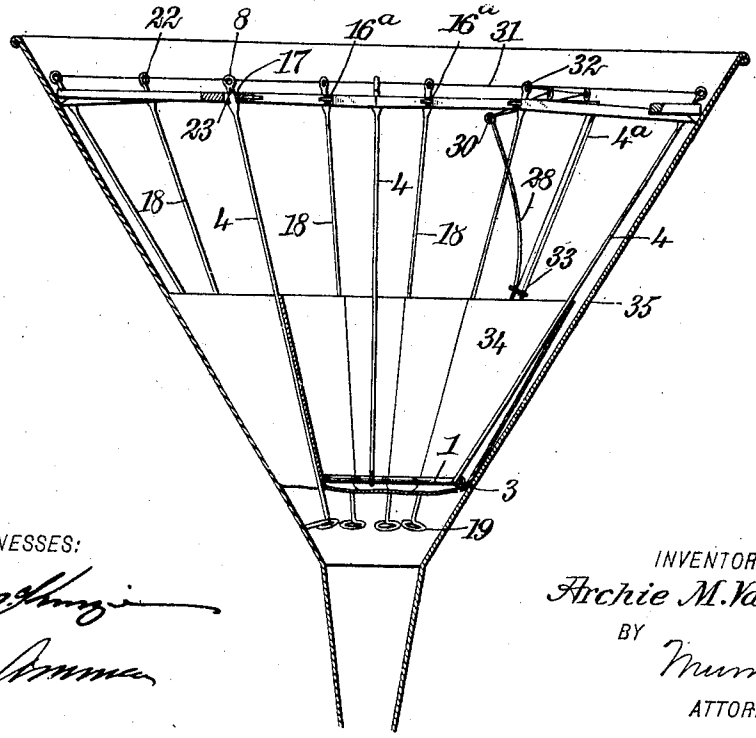


Fig. 3.



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ARCHIE MUSGRAVE VAUGHAN, OF RICHMOND, VIRGINIA.

FRAME FOR FILTER-PAPERS.

No. 832,936. Specification of Letters Patent. Patented Oct. 9, 1906.

Application filed January 18, 1906. Serial No. 296,607.

To all whom it may concern:

Be it known that I, ARCHIE MUSGRAVE VAUGHAN, a citizen of the United States, and a resident of Richmond, in the county of Henrico and State of Virginia, have invented a new and Improved Frame for Filter-Papers, of which the following is a full, clear, and exact description.

This invention relates to a frame the purpose of which is to facilitate the folding and placing of a filter-paper within a funnel.

More specifically, the object of the invention is to produce a frame for this purpose which is simple in construction and which may be readily operated in applying the paper and in folding the same to conform to the shape of the funnel.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan of the frame, showing the same extended as when laid upon a flat surface. Fig. 2 is a plan of a funnel, showing the frame in a folded position and holding a filter-paper which is applied within the funnel. Fig. 3 is a vertical cross-section through Fig. 2, certain parts being shown in elevation and broken away. Fig. 4 is a section taken near the center of the frame and showing a joint formed at this point. Fig. 5 is a perspective showing the form of the outer extremities of the main arms of the frame. Fig. 6 is a perspective showing the construction of the inner extremities of certain folder-arms or folders which constitute a feature of the invention. Fig. 7 is a perspective showing the construction of the outer extremities of the folders just referred to. Fig. 8 is an elevation showing the manner of constructing a joint which constitutes a feature of the frame. Fig. 9 is an elevation showing in detail and upon an enlarged scale the locking-spring which assists in retaining the folders, and Fig. 10 is a side elevation showing a portion of the rim of the frame and illustrating the manner in which the folders open out to allow the filter-paper to be applied to the frame.

Referring more particularly to the parts, 1 represents the center or spider of the frame. This spider is preferably formed out of stout wire, which is bent so that a plurality of radially-projecting arms 2 are presented. These arms 2 terminate in wrists 3, which extend transversely to a radial line, as shown. To these wrists 3 a plurality of main arms 4 attach, the inner extremities of the arms being formed into eyes 5, as indicated in Fig. 4, which are bent around the wrists, as will be readily understood. In this way free joint connections are formed at the extremities of the arms. At their outer extremities the main arms 4, which are preferably formed of round wire, are shaped as indicated in Fig. 5, the same being formed with laterally-projecting shoulders 6 and reduced necks 7 therebeyond, the material beyond the said necks 7 being bent to form an eye 8. These main arms 4 support a rim 9, which is of polygonal form and is constructed of a plurality of links 10, formed with joints 11 at their middle points, as shown. These extremities of these links are preferably beveled (indicated at 12 and 13) and laid so that their ends overlap, as shown. They are formed with alining openings at this point, which receive the aforesaid necks 7, the eyes 8 affording means for preventing the links from slipping off the ends of the arms, as will be readily understood. In this connection it should be understood also that the shoulders 6 prevent the rim-sections 10 or links from moving inwardly.

The links 10, which compose the rim 9, are preferably generally square in cross-section. The form of the joints 11 is illustrated in Fig. 8. Of each pair of links 10 which come together one link 10^a is bifurcated, so as to present ears 14, and these ears receive a pivot-pin 15, which passes through the extremity of the opposite link 10^b, as shown. Each link 10^a is provided with an offset or laterally-projecting tongue 16, the body whereof inclines to the longitudinal axis of the link, as shown. In this tongue there is formed an elongated substantially rectangular opening 17, which is preferably slightly curved, as shown. The link 10^b is formed with a projection or finger 16^a, which is adapted to strike the outer side of the link 10^a, so as to limit the movement of the joint in one direction. Through each of the openings 17 a folder-arm or folder 18 passes. The construction of these folder-arms is very clearly shown in Figs. 6 and 7. At its lower extremity each arm is bent so as to form a laterally-disposed eye 19. At its up-

per extremity each of the folders is expanded, so as to form a shoulder 20 with a reduced rectangular neck 21 therebeyond. Beyond each neck 21 an eye 22 is formed for a purpose which will appear more fully hereinafter. These folders are supported in the openings 17 by threading the upper ends of the folders into the openings, as will be readily understood. In order to retain the folders, I provide each folder with a spring 23, the construction of which is indicated in Fig. 9. This spring is preferably formed of light wire bent into the general form of an inverted keystone, presenting a recess 24 on its upper side. In this way two oppositely-disposed shoulders 25 are formed. In addition to this I provide each neck 21 with a pin-hole 26, and at this pin-hole I attach the spring 23. In this way the springs operate as pins to support the folders.

Referring especially to Fig. 1, it will be observed that between the arms 2 the center presents deep angles or notches 27, and it will be observed also that the folders lie exactly opposite these angles or notches. One of the arms 4, such as the arm 4^a, I prefer to make of special construction. The change consists in making the arm of stouter material and attaching on the inner or upper face thereof a spring 28. The lower extremity of this spring is rigidly attached to the arm by a suitable clip 29, and the upper extremity of the spring tends to press itself inwardly toward the center or spider 1, as indicated most clearly in Fig. 3. The upper extremity of the spring 28 is formed into an eye 30, through which an endless cord 31 passes, and this cord passes continuously through the eyes 8 and 22, which are formed at the outer extremities of the main arms and folders. In order to assist in guiding this cord, near the special arm 4^a I provide guiding-eyes 32, which are attached in the outer sides of the adjacent links 10, as shown most clearly in Fig. 1. The sections 10^a and 10^b of the links 10 are connected so that the fingers 16^a are disposed upwardly. From this arrangement it should be understood that the joints 11 will break upwardly but not downwardly.

Referring again to the special arm 4^a, I provide a runner or ring 33, which is slidably mounted upon the same and passes around the spring 28. It should be understood that the spring 28 affords means for controlling the cord 31. This cord is sufficiently long to allow the lower extremities of the folders 18 to hang down somewhat, as indicated in Fig. 10, when the ring 29 is occupying its uppermost or outermost position. With the lower ends of the folder-arms removed in this manner the filter-paper is applied centrally to the frame on the under side thereof, whereupon the joints 11 will be broken upwardly or inwardly, so as to contract the frame into substantially the relation shown in Figs. 2 and 3. As the frame is folded up in this manner to apply the same within the funnel, the ring 33 will be slid downwardly on the arm 4^a. Then the spring 28 will operate to take up the slack of the cord 31, and this will pull outwardly on the eyes 22, forcing the lower extremities of the folders inwardly, and this way the filter-paper 34 will be forced into the recesses or angles 27, and the paper will be folded into a star-shaped form having the general shape of an inverted cone.

Referring especially to Fig. 3, attention is called to the fact that the folders 18 project below the spider 1, so that the eyes 19 at their lower extremities do not come in contact with the filter paper 34. They operate, however, to hold the lower portion of the filter-paper away from the side of the funnel 35, as indicated. The curvature of the openings or slots 17 facilitates the outward movement of the lower extremities of the folders, so that they may assume the position shown in Fig. 10. In this connection it should be understood that the movement is lateral as well as radial.

While I have represented the frame as of octagonal form, it should be understood that it is not necessary to adopt this particular form; but any number of sides for the polygon or frame may be chosen, as desired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a device of the class described, in combination, a jointed frame adapted to be contracted, and means for attaching filter-paper within the same.

2. In a device of the class described, in combination, a frame presenting a plurality of radial arms, a spider attached to said arms, and means for attaching a filter-paper upon said arms.

3. In a device of the class described, in combination, a folding frame adapted to have a filter-paper applied thereto, and folders attached to said frame and coöperating therewith to fold said filter-paper.

4. In a device of the class described, in combination, a frame comprising a spider, a plurality of radially-disposed arms attached to said spider, a rim attached to said arms, and folders attached to said rim and coöperating with said arms to fold a filter-paper thereupon.

5. In a device of the class described, in combination, a spider, a plurality of main arms attached thereto, jointed links connecting the outer extremities of said arms, folders carried by said links and coöperating with said spider to fold a filter-paper on said frame.

6. In a device of the class described, in combination, a folding frame having a rim, folders mounted in said rim and coöperating with said frame to fold a filter-paper there-

upon, and means for controlling said folders simultaneously whereby the same may be opened out to apply the paper.

7. In a device of the class described, in combination, a spider, a plurality of arms attached thereto and extending radially therefrom, links having joints and connecting the outer extremities of said arms, folders mounted at said joints and coöperating with said spider to fold the paper applied thereto, a running string engaging said folders and folding the same.

8. In a device of the class described, in combination, a spider having a plurality of arms forming recesses therebetween, main arms freely attached to said first arms and extending radially from said spider, links having joints and connecting the outer extremities of said main arms, said links having slots formed near said joints, folders mounted in said slots and projecting toward said spider, said folders and said main arms having eyes formed therein, a running string passing through said eyes, and a spring controlling said string.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARCHIE MUSGRAVE VAUGHAN.

Witnesses:
DANA WHITE,
KENT VAUGHAN.