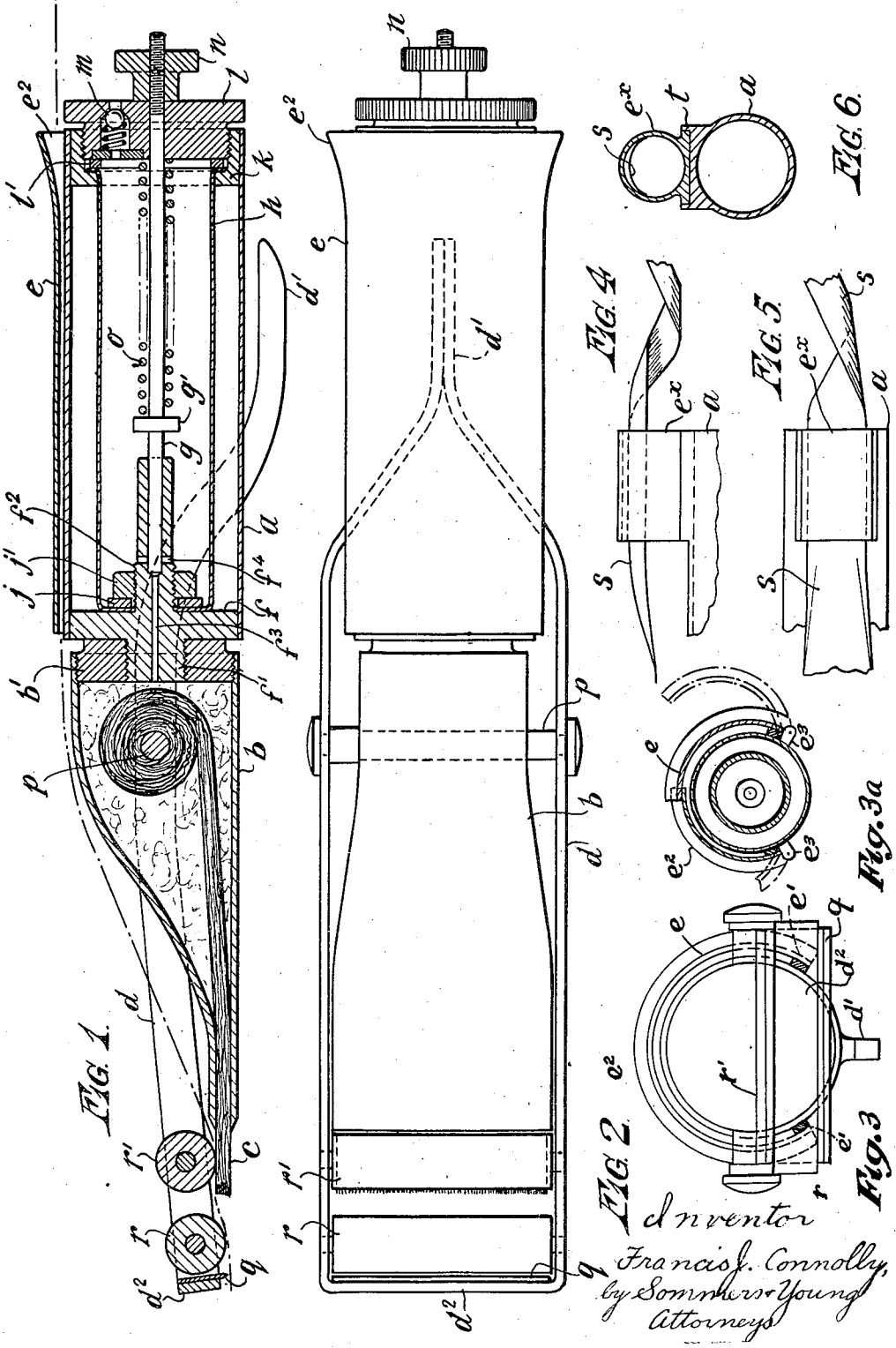
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STRIP AFFIXING DEVICE

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STRIP AFFIXING DEVICE

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This invention relates to improvements connected with devices for affixing tape, ribbon and like strips and is concerned with portable hand devices for affixing strip material such as gummed paper strip or adhesive tape to the surfaces of articles such as parcels.

One object of the present invention is to enable the strip of material to be passed into an affixing device without danger of jamming or tearing. Another object is to adapt the portable hand devices in question so that by a ready interchange of parts they can be used for the application of strips of different widths, whereas at present a separate device complete in itself is necessary for each width of strip to be applied. Another object is to provide a liquid reservoir of more convenient shape and dimensions and better adapted for manipulation than those heretofore provided. Yet another object is to provide for the more convenient and efficient hand operation of pivotally mounted affixing means and severing means mounted at the delivery end of the appliance.

With portable hand devices for affixing a strip taken from a roll, the strip may easily become curled, coiled or cockled in its passage between the reel and the hand device, particularly if the latter is being worked around the several sides of a package. The result is that as such curled strip arrives at the intake guides of known devices, which guides are adapted for receiving the strip in a flat condition, the curled strip is apt to jam, catch or tear in the inlet thereby involving a loss of time and material. Moreover, a gummed paper strip may become gummy or tacky in passing to the device, or when coming into contact with guide parts of the device and an adhesive tape may be tacky and sticky as it comes from a reel or roll. For this reason it is desirable that the gummy or tacky surface of a strip or tape should not come into contact with parts of the device until such strip arrives at the point where it is to be affixed, or where it is to be moistened preparatory to being affixed. The present invention provides means for enabling such undesirable contact to be avoided.

According to this invention, a guide means comprising a curved surface is provided at the entry of the strip or tape into the affixing device, the action of this guide means being to impart a transverse curvature to the strip or tape sliding through it. The guide means may be a length of tube of circular cross section and presenting a smooth bore, the diameter of the tube being less than the width of the strip or tape to be dealt with. A strip or tape threaded through such tube acquires a transversely bent form therein. Thus, in cross-section it may appear as a segment of a circle, for example a semicircle, or it may even be bent into substantially circular form. When gummed strip or adhesive tape is passed into the device, the surface bearing the gum or adhesive is on the inner side of the bend and with gummed paper strip there is a natural tendency favouring the bending or curling of the strip in this manner.

A strip or tape entered through this guide means is passed to the affixing means disposed at a suitable distance ahead. As the strip is applied and is consequently drawn through the guide means, it is immaterial to what extent it may have become curled or coiled in its passage from the reel to the affixing device for in any condition it is found to pass smoothly and easily into the guide means and longitudinally to straighten itself out from any tangling that may have occurred. Having passed through the guiding means, the strip gradually flattens out transversely as it approaches the affixing means and its gummy or tacky surface makes no contact with any part of the device until the affixing means are reached. The feed is reliably smooth, unchecked and uninterrupted.

In hand-operated affixing devices, the width of the devices is usually a little more than that of the strip or tape in use. If it is desired to employ a wide strip, for example, four inches in width, the width of the affixing device becomes uncomfortably large, or impossible, for grasping by the hand. With the improved guiding means of this invention however, a tube of much less than four inches in diameter can be used for a strip of four inches in width, which means that that portion of the affixing device whereon the tube is mounted can be of greatly reduced width and therefore easily grasped in the hand.

Finally, in hand-operating affixing devices of the kind in question, guide means at the entry have been adapted for automatically preventing withdrawal of the strip or tape, for without such means the flat sliding strip could easily be unintentionally retracted. Such auxiliary means are dispensed with by the present invention, for the transverse spreading or flattening out of the strip at each end of the guide means, provides just that amount of resistance which is required for preventing unintentional retraction of the strip.

Further, according to the present invention, the appliance is adapted for the ready interchangeable attachment of nozzle heads of dif-

ferent width, each having its own appropriate fixing means, whereby when a strip of different width is to be affixed, all that is required is to substitute an appropriate nozzle head and affixing means of a different width from that previously in use. The reservoir to which the nozzle head is attached is advantageously of tubular or cylindrical form making it very convenient for grasping by the hand and such reservoir preferably contains a flexible bag for containing the liquid requiring to be fed to the wick or absorbent material in the nozzle head. The affixing means which is pivotally mounted on the nozzle head is provided with an operating lever which extends beneath the reservoir so that it can be operated by fingers of the hand grasping the reservoir. By this arrangement, the affixing means is very much more conveniently and surely operated as compared with affixing means requiring to be operated by a finger extended forwardly from the hand grasping the device.

In order to enable the invention to be readily understood, reference is made to the accompanying drawing wherein:

Figure 1 is a central longitudinal sectional elevation of one construction of affixing appliance embodying the present improvements.

Figure 2 is a plan of the device illustrated in Figure 1.

Figure 3 is an end view of the appliance as seen from the left hand side of Figure 2.

Figure 3*a* is a cross section, to a smaller scale than Figure 3, illustrating a modification.

Figure 4 is a diagrammatic elevation of the rear end portion of an affixing appliance with a modified form of strip-guiding means, the passage of a curled strip into and through the guiding means being indicated.

Figure 5 is a plan of Figure 4, and

Figure 6 is a cross-section of Figure 4.

Referring to Figures 1 to 3 of the drawings, *a* is a cylindrical casing enclosing a water reservoir as hereinafter described and serving as a handle for holding the appliance. *b* is a nozzle head detachably connected with the cylindrical casing *a* and containing a wick *c* for wetting the strip to be affixed. *d* is a lever pivotally mounted on the nozzle head *b* and carrying the strip pressing and severing means hereinafter described, and *e* is a cylindrical or tubular guide for the strip to be affixed.

As seen in Figure 1, the left hand end of the casing *a* is closed by a disc *f* formed centrally on its outer side with a screw threaded spigot f^1 and on its inner side with a screw threaded stub f^2. A small duct f^3 passes through the spigot f^1 and stub f^2 and terminates within the stub at a seating for the end of a valve rod *g*. Radial ports f^4 in the stub f^2 communicate with the central bore in which the valve rod *g* slidably fits. A cylindrical water bag *h* of rubber or waterproof material has its inner end secured water-tightly against the disc *f* by means of a washer *j* and a nut j^1 screwed on to the stub f^2. The outer end of the cylindrical casing *a* is closed by a ring *k* which is screw threaded to receive a screw plug *l*. The ring *k* is formed with a shoulder to seat the out-turned end of the bag *h* and such seating may be effected by a washer ring l^1 forced against the said out-turned end by the screwing in of the plug *l*. A non-return valve *m* in the plug *l* permits air to enter the bag *h* but prevents water escaping from the bag. The valve rod *g* extends through a central perforation in the plug *l* and its end portion is screw threaded to receive a milled nut *n*. A compression spring *o* operating between the plug *l* and an abutment g^1 on the rod *g*, normally holds the valve shaped end of such rod hard against its seating in the stub f^2. As will be apparent, the valve end of the rod *g* can be withdrawn temporarily from its seating and so as to uncover the ports f^4 by pulling the rod *g* against the resistance of the spring *o* and using the nut *n* as a finger grip. Or, the said withdrawal and valve opening can be effected in a graduated and lasting manner by turning the nut *n*.

Referring to Figures 1 to 3, the nozzle head *b*, which is of so-called shoe-form in the section in Figure 1, has a flattened toe portion of the width of the wick *c* which is of the same width as the strip to be affixed. The heel portion of the nozzle head is of reduced width and of somewhat cylindrical form. This end of the nozzle head is closed by an annulus b^1 which is internally screw threaded for enabling the nozzle head to be detachably connected with the casing *a* by screwing on to the spigot f^1. The wick *c* may be coiled around a transverse pin *p* extending through the side walls of the nozzle head. The uncoiled portion of the wick is taken along the flat sole portion of the nozzle head *b* and passed through the slot or orifice of the latter and so as to extend a little beyond such orifice as shown in Figures 1 and 2. Thus, the wick can be pulled out to a desired extent or to make up for wear. Space within the nozzle head, which otherwise would remain unoccupied, may be filled with an absorbent such as cotton wool, as indicated in Figure 1.

The transverse pin *p* in the nozzle head may have its end portions adapted to serve as pivots for arms or prongs of the lever *d*. The said arms or prongs at one end are brought together and bent to form a handle d^1 which extends beneath the cylindrical casing *a* in such manner that the handle d^1 can be pressed upwards by fingers of a hand grasping the said casing. At their outer end, the arms of the lever *d* support between them two revoluble transverse rollers *r* r^1. These latter are spaced apart in the longitudinal direction, the roller r^1 coming above the protruding portion of the wick *c* and the roller *r* being in advance of the tip of the wick. A cross bar d^2 may connect the arms at the free end and may serve as a support for a cutter *q* which may be of the razor edge variety, or of the serrated variety and which may be of flat formation as shown in Figure 2 or may be of a slightly curved formation to facilitate cutting. In Figure 2, the cutter *q* is shown set at right-angles to the longitudinal axis of the appliance but it may, with advantage, be set slightly askew of the right-angled position.

The strip guiding means *e* is of tubular or cylindrical formation and, in the example illustrated, it surrounds the casing *a*. The guide *e* need not be a complete tube or cylinder, for its bottom segment may be cut away as seen in Figure 3, the longitudinal edges thus formed being attached to supporting bars or blocks e^1 on the casing *a*. At the rear end, the tubular guide *e* may be flared, as at e^2, to facilitate entry of a strip into such guide.

The appliance is made ready for use and is operated in the following manner: The wick *c* having been adjusted to protrude to a suitable extent, as seen in Figure 1, the bag *h* is charged with water. This may be done either by removing the plug *l* or by forcing water past the spring

loaded valve m. The valve rod g is then moved endwise so as to uncover the ports f^4, whereupon water passes from the bag h through the ports f^4 and the duct f^3 into the nozzle head b. This water is absorbed by the cotton wool and the wick c in the nozzle head b and when the wick c is sufficiently wet, the valve rod g may be released so as to cut off the ports f^4 and seat itself to close the duct f^3. A gummed paper strip (indicated by chain line) is then inserted at the flared end e^2 of the guide e and passed through the latter and, upon emerging at the opposite end, is drawn forwards and led beneath the rollers r r^1. To affix the strip to a package, the appliance is grasped by a hand gripping the guide e and the cylindrical casing a, fingers of the hand being extended so as to apply upward pressure against the handle d^1 of the lever d. Such upward pressure on the handle d^1 causes the free end of the lever d to be depressed so that the roller r presses the strip upon the surface of the package to be treated, whilst the roller r^1 presses the gummy face of the strip upon the wet tongue of wick prortuding from the nozzle head b. By now drawing the appliance in the desired direction, the roller r presses the wetted strip upon the package and owing to the strip being held by the roller r, and also by its adhesion when it begins to stick to the package, it is drawn through the appliance as required. When the required length has been affixed, the appliance is held still and tilted a little about the axle of the roller r as fulcrum. This, aided possibly by a slight twist, produces depression of the blade q and severance of the strip at a point a little in advance of the roller r.

The functioning of the guide e will be readily understood from Figures 4 to 6, although these figures illustrate a modification wherein the guide e^x is completely tubular and is mounted upon the top of a cylindrical casing a instead of surrounding the latter as in Figures 1 to 3. This guide e^x is formed with a flat base which fits into a trough t on the cylindrical casing a such trough being of the kind heretofore used as a flat guide for a strip s. As will be seen from Figure 6, the strip s is bent to an arched form whilst in the guide e^x and usually the arch form will fit the interior of the cylindrical guide, the separation of the strip from the guide in this figure merely being for the sake of clearness. Owing to this bending of the strip s, its normal width in the flat state is reduced. Referring to Figures 4 and 5, it will be seen that when the strip s emerges at the left hand end of the guide e^x and passes to the affixing rollers which flatten it, it reacquires its normal width in the flat state as shown. Consequently, resistance is offered to retraction of the strip s through the guide e^x from left to right and such resistance renders it usually unnecessary to employ special gripping means designed for preventing withdrawal of the strip. When the strip s is drawn from a reel or roll which may be some little distance away, the strip in its passage from the reel to the appliance is liable to become cockled or coiled, as indicated in Figures 4 and 5. This is particularly the case when the appliance is being worked around several sides of a package, for example. With a flat guide, and particularly one having a slot-like entry, there is danger of the strip jamming and tearing when in the coiled or cockled state but with the cylindrical guide provided by these improvements the strip in any condition passes easily into and through the guide and then gradually flattens out as it approaches the affixing rollers. The cylindrical guide e of Figures 1 to 3 operates in the same manner and with precisely the same advantages as the cylindrical guide e^x in Figures 4 to 6. When a strip having a tacky gummy surface has to be applied, a cylindrical guide e disposed as in Figure 1 might bring the tacky surface too near to the surface of the cylindrical casing a so that interference with the feed of the strip might occur if the two surfaces came into contact. For strips with tacky surfaces, therefore, it may be preferable to mount the cylindrical guide at a greater distance from the cylindrical casing a, as for example in Figures 4 to 6.

A further modification consists in longitudinally dividing a guide, such as the guide e in Figures 1 to 3, and in mounting each divided part on a hinge at one of the supports e^3 e^3 Figure 3. The said parts would preferably be made to overlap along their dividing line when in the operative position. With this modification, the two divided parts can be opened out as shown, by turning them like flaps on their hinge mountings, when a new strip is to be introduced into the appliance. This avoids the possibly tiresome operation of threading the strip through the narrow guiding space seen in Figure 1, for with the modification the flaps are opened outwards, the strip is readily arched and disposed lengthwise over the cylindrical casing a, whereupon the flaps are again closed over the casing to constitute the cylindrical guide e hereinbefore described.

I claim:

1. Portable hand device for affixing adhesive strip comprising strip affixing means adapted for flattening the strip upon a surface, and curved guide means adapted for imparting a transverse curvature to the strip during its passage through said guide means and towards said affixing means, said guide means terminating at a distance from said affixing means to permit the strip to flatten out transversely as it approaches the affixing means.

2. Portable hand device for affixing adhesive strip comprising strip affixing means adapted for flattening the strip upon a surface, and cylindrical guide means adapted for imparting a transverse curvature to the strip during its passage through said guide means and towards said affixing means, said cylindrical guide means terminating at a distance from said affixing means to permit the strip to flatten out transversely as it approaches the affixing means.

3. Portable hand device for affixing adhesive strip comprising strip affixing means, a hand grip part supporting said affixing means, and a cylindrical guide mounted on said hand grip part, said guide part being adapted for imparting a transverse curvature to the strip during its passage through said guide and towards said affixing means and being terminated at a distance from said affixing means to permit the strip to flatten out transversely as it approaches the affixing means.

4. Portable hand device for affixing adhesive strip comprising strip affixing means, a cylindrical hand grip part supporting said means, and a cylindrical guide disposed around said hand grip part and adapted for imparting a transverse curvature to the strip during its passage through said guide and towards said affixing means, said cylindrical guide terminating at a distance from said affixing means to permit the strip to flatten

out transversely as it approaches the affixing means.

5. Appliance for affixing adhesive strip comprising a nozzle device, a wick housed within said nozzle device and extended through the orifice thereof, strip-pressing means, a lever mounted on said nozzle device and supporting said strip-pressing means, a liquid reservoir formed to serve as a hand-grip, coupling means detachably connecting said reservoir with said nozzle device and formed with an intercommunicating water duct, and strip-guiding means mounted on said reservoir.

6. Appliance for affixing adhesive strip comprising a nozzle device, a wick housed within said nozzle device and extended through the orifice thereof, a liquid reservoir formed to serve as a hand grip, coupling means detachably connecting said reservoir with said nozzle device and formed with an intercommunicating water duct, strip guiding means mounted on said reservoir, a two-armed lever pivotally mounted on said nozzle device and having one of its arms extended as a handle beneath said reservoir, and strip presssing means mounted on the other arm of said lever so as to be operative just beyond the orifice of said nozzle device.

7. Appliance for affixing adhesive strip comprising a nozzle device, a wick housed within said nozzle device and extended through the orifice thereof, a casing formed to serve as a hand grip, coupling means detachably connecting said casing with said nozzle device and formed with an intercommunicating water duct, a water bag fixed watertightly within said casing, self-closing valve means controlling admission to said water bag, strip guiding means mounted on said casing, a two-armed lever pivotally mounted on said nozzle device and having one of its arms extended as a handle beneath said casing, and strip pressing means mounted on the other arm of said lever so as to be operative just beyond the orifice of said nozzle device.

8. Appliance for affixing adhesive strip comprising a nozzle device, a wick housed within said nozzle device and extended through the orifice thereof, a cylindrical reservoir adapted to serve as a hand grip, coupling means detachably connecting said reservoir with said nozzle device and formed axially with an intercommunicating water duct, an axial self-closing valve normally closing the passage through said duct, a pull rod operative for opening said valve, strip guiding means mounted on said reservoir, a two armed lever pivotally mounted on said nozzle head and having one of its arms extended as a handle beneath said reservoir, and strip pressing means mounted on the other arm of said lever so as to be operative just beyond the orifice of said nozzle device.

9. Appliance for affixing adhesive strip comprising a nozzle device, a wick housed within said nozzle device and extended through the orifice thereof, a liquid reservoir formed to serve as a hand grip, coupling means detachably connecting said reservoir with said nozzle device and formed with an intercommunicating water duct, strip guiding means mounted on said reservoir, a two-armed lever pivotally mounted on said nozzle device and having one of its arms extended as a handle beneath said reservoir, strip pressing means mounted on the other arm of said lever so as to be operative just beyond the orifice of said nozzle device, and a cutter mounted on said other arm in advance of said strip pressing means and operative for severing an affixed length of strip.

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