

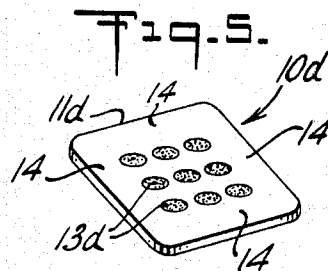
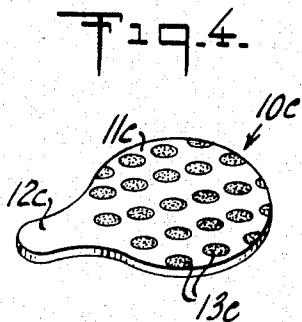
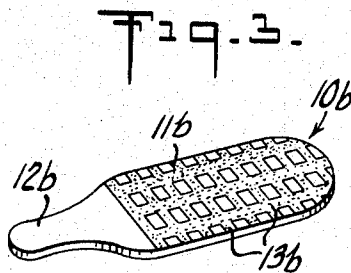
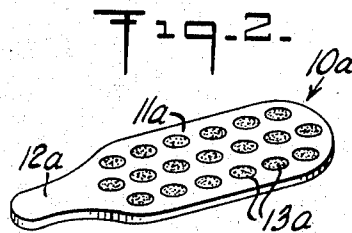
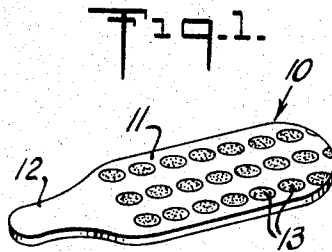
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ABSORBENT ADHESIVE PATCH IMPREGNATED WITH A VASOCONSTRICTOR

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3,342,183

ABSORBENT ADHESIVE PATCH IMPREGNATED WITH A VASOCONSTRICTOR

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The present invention relates to an applicator for vasoconstrictive substances. More particularly, it relates to absorbent patches impregnated with a vasoconstrictor.

The use of vasoconstrictors to retard or stop the bleeding of surface cuts is well known and widely applied in cases where rapid termination of bleeding is imperative for medical reasons or is otherwise desirable.

Many small cuts occur during daily activity which clot quickly leaving only a small scab. Since, with these cuts, the rapid stoppage of bleeding is not imperative for medical reasons, vasoconstrictors are not usually applied. However, when these small cuts occur in the area of the face or legs during such activities as shaving, the rapid stoppage of blood, minimization of scab size, and elimination of blood from the surrounding areas of the skin become important for cosmetic reasons.

If these cuts are allowed to clot by the natural processes, not only do substantial scabs form, but the area surrounding the wound site becomes covered by hardened blood. When the surface is washed with water to remove the blood from areas surrounding the cut, invariably the scab will also be removed and bleeding will resume.

While it has been possible to obtain vasoconstrictors in liquid form for application to these cuts, such liquids have not eliminated these problems. During the time required for liquid application, substantial bleeding occurs, and after vasoconstrictor application, the same unsightly splotches of hardened blood are formed on the skin surrounding the cut. If the skin is washed, bleeding is likely to resume. In addition, liquid applications are extremely messy because of the tendency of the solution to run.

Vasoconstrictors have sometimes been applied to the surface of the skin by impregnating a cotton wadding with the substance and then pressing the cotton against the cut. This type of application was time consuming since the cotton had to be held in place while waiting for the bleeding to stop, thus preventing the user from proceeding with his normal course of activity. In shaving, where numerous cuts are likely to occur, this lost time could be substantial.

It is therefore an object of this invention to provide an applicator which will allow quick and easy application of vasoconstrictive material to these small cuts and will at the same time remove blood from the surface of the skin, thus eliminating any evidence of the cut, without hindering the action of the vasoconstrictor.

It has been discovered that this object can be obtained by an applicator in the form of a small patch of absorbent sheet material containing a vasoconstrictor on at least one surface thereof, and an adhesive printed thereon in an open pattern so as to leave numerous areas free from adhesive.

When the patch is applied to a bleeding cut, the adhesive acts to hold the patch in intimate contact with the wound. This adhesive is printed onto the surface of the patch in an open pattern so that substantial areas of absorbent sheet material remain free of adhesive. Thus the blood from the cut will be quickly absorbed by the absorbent sheet through these open areas.

This absorption of blood in turn effects a rapid and positive release of vasoconstrictor onto the wound site. When the pad is removed, the site is clean due to the

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absorption of the blood into the pad, and the cut will not bleed again due to the action of the vasoconstrictor.

When a moisture activatable adhesive is used, the vasoconstrictor and adhesive may be printed together on the pad in the open pattern. When such a pad is applied to a bleeding cut, the blood will simultaneously soften and activate the adhesive and effect release of vasoconstrictor from the printed areas.

Means can be provided for easy removal of the patch by shaping the patch so as to present a small tab of sheet material free from adhesive. The patch is then removed by grasping the tab and peeling. The same effect may be obtained by printing the adhesive so that a small margin of the sheet material at the periphery remains adhesive free.

The invention may be more easily understood by reference to the drawings wherein FIGURES 1 through 5 are views in perspective of the various applicators of this invention.

Referring now to the drawings, FIGURE 1 illustrates a patch 10 of the present invention. An absorbent sheet 11 has been impregnated with a vasoconstrictor, and an adhesive has been applied to the impregnated sheet material in an open substantially rectangular pattern of small discrete dots 13. A tab like appendage 12 of the patch is left free of adhesive so as to provide a tab for the user to grasp while peeling the bandage from the skin after use.

FIGURE 2 illustrates another patch 10a of this invention. An open pattern of discrete spots 13a of adhesive has been deposited on impregnated absorbent sheet 11a in a diamond formation. A tab like appendage 12a of the patch remains free of adhesive.

The patch 10b illustrated in FIGURE 3 contains an adhesive in an open grid-like pattern 13b on the impregnated absorbent sheet 11b. A small tab like appendage 12b again remains free of adhesive.

The patch 10c in FIGURE 4 is another patch of the invention, having a different shape from those hereinbefore described, wherein the adhesive is applied to the impregnated absorbent sheet 11c in an open pattern of small discrete dots 13c in diamond formation. Tab like appendage 12c remains free of adhesive.

The rectangular patch 10d illustrated in FIGURE 5 contains an adhesive in an open pattern of discrete dots 13d, on impregnated absorbent material 11d. A margin 14 around the periphery of the patch is left free of adhesive so that the user may easily grab hold of the edge of the patch and facilitate its removal.

The vasoconstrictor components gives the patch its bleeding retarding characteristics. While many vasoconstrictors may be used in the system, methylaminoacetatechol·HCl (sold by Winthrop Laboratories as Stryphon·HCl), has been found to possess particularly high vasoconstrictive activity when subjected to the conditions under which the patch is used.

For the rapid clotting desired, the vasoconstrictor may be present on the sheet in any amount greater than about one percent (1%) by weight of the dry weight of the absorbent sheet material, and preferably in amounts from about three percent (3%) to about five percent (5%) of the weight of the absorbent sheet material. When a remoistenable adhesive is used and the vasoconstrictor and adhesive are both printed on the pad, the vasoconstrictor should be present in an amount greater than about one (1) milligram per square inch of surface area and preferably in amounts of from about three (3) to about five (5) milligrams per square inch of surface area. The concentration of the vasoconstrictor in the printing solution, therefore, must be adjusted relative to the amount of printing solution to be applied to the pad. While greater

concentrations of vasoconstrictor may be used, they do not substantially increase the speed of bleeding retardation.

The adhesive used is preferably a remoistenable adhesive. This classification includes any water soluble adhesive; however, polyvinyl alcohol, polyvinyl acetate, and methyl cellulose are preferred since they are approached by the Food and Drug Administration for cosmetic use. The adhesive component usually is present on the patch in amounts of from about one (1) milligram to about five (5) milligrams per square inch of surface area. If too much adhesive is applied, the adhesive areas may be raised with respect to the adhesive free areas to the point that the adhesive free areas will not be in intimate contact with the skin. This is generally to be avoided as it interferes with the absorption of blood from the cut.

In an alternate embodiment of the invention, a normally tacky and pressure sensitive adhesive may be substituted for the remoistenable adhesive.

The absorbent backing may consist of any absorbent material that is substantially nap free. Standard filter paper, such as Whatman #3, has been found to be particularly useful because it is clean, cheap, and possesses considerable stiffness.

If desired, any conventional antiseptic may be added to the solution printed onto the pad in any amount consistent with the printability requirements mentioned earlier. Normal vegetable colorings may be similarly added.

The applicator of this invention may be produced by impregnating the sheet material with the vasoconstrictor and then over-printing with the adhesive in the desired open pattern. When a moisture activatable adhesive is used, a solution containing both the adhesive and the vasoconstrictor can be printed on the absorbent sheet material in the desired pattern. This latter procedure is preferred where possible, since impregnation of the entire pad with vasoconstrictor impedes its absorbency.

As previously mentioned, the concentration of the various printing solutions must be adjusted in the light of the amount of each material desired on the patch and the amount of solution to be applied to the patch. The pattern of adhesive printed on the patch may be any pattern consistent with the concentration of adhesive desired on the pad, proper pressure sensitive adhesive properties, and retention of a requisite amount of absorbency. Anywhere up to ninety percent (90%) of the surface area of the applicator may be so printed while still retaining sufficient absorbency; but about thirty percent (30%) is preferred. If the preferred pattern of small discrete spots is used, the patch preferably contains from about seventy-five (75) to about one hundred twenty-five (125) spots of about one-sixteenth ($\frac{1}{16}$) inch diameter per square inch of surface area.

The invention will be further illustrated in greater detail by the following examples. It should be understood that although these examples may describe some of the more specific features of the invention, they are given only for the purpose of illustration and the invention should not be construed as limited thereto.

EXAMPLE I

A solution containing ten (10) parts of Stryphnon·HCl and ten (10) parts of a cold-water soluble polymer of vinyl alcohol, is formulated in sixty (60) parts cold water. The solution is silk-screened on a six (6) inch Whatman #3 filter paper at an eight-tenth (0.8) gram wet pick-up. The dry filter paper weighs three and two-tenths (3.2) grams. The silk screen contains one hundred (100) holes per square inch, each hole being about one-sixteenth ($\frac{1}{16}$) inch in diameter.

The printed pad is dried for fifteen (15) minutes at 250° Fahrenheit, and is then sterilized under steam for twenty (20) minutes at 250° Fahrenheit. The pad contains five and sixty-six hundredths (5.66) milligrams Stryphnon·HCl per square inch of surface area.

The pad is then cut into one (1) inch by one-quarter ($\frac{1}{4}$) inch strips. The strips are tested for hemostatic activity on a dog by applying them to a small bleeding cut. The strips, on being moistened by the blood, adhere to the skin on contact. When the patches are removed after one (1) minute, bleeding has ceased and the area surrounding the wound is clean of blood, the same having been absorbed by the patch.

EXAMPLE II

A solution containing ten (10) parts of Stryphnon·HCl and ten (10) parts of a cold-water soluble polymer of vinyl alcohol, is formulated in two hundred eighty (280) parts cold water. The solution is silk-screened on a six (6) inch Whatman #3 filter paper at an eight-tenths (0.8) gram wet pick-up. The dry filter paper weighs three and two-tenths (3.2) grams. The silk screen contains one hundred (100) holes per square inch, each hole being one-sixteenth ($\frac{1}{16}$) inch in diameter.

The printed pad is dried for fifteen (15) minutes at 250° Fahrenheit, and is then sterilized under steam for twenty (20) minutes at 250° Fahrenheit. The pad contains one and forty-four hundredths (1.44) milligrams Stryphnon·HCl per square inch of surface area. The pad is then cut into one (1) inch by one-quarter ($\frac{1}{4}$) inch strips. The strips are tested for hemostatic activity on a dog by applying them to a small cut. The strips, on being moistened by the blood, adhere to the skin on contact. When the patches are removed after one (1) minute, bleeding has ceased and the wound is clean of blood, the same having been absorbed by the patch.

EXAMPLE III

A solution is formulated containing ten (10) parts of Stryphnon·HCl and seven hundred (700) parts cold water. A six (6) inch circle of Whatman #3 filter paper is placed in a beaker of the solution and is impregnated to one hundred percent (100%) wet pick-up. Two (2) grams of solution are absorbed by the filter paper. The filter paper is dried for fifteen (15) minutes at 250° Fahrenheit.

A solution is formulated containing ten (10) parts of a cold-water soluble polymer of vinyl alcohol in two hundred (200) parts water. This solution is silk-screened on the impregnated filter paper at an eight-tenths (0.8) gram wet pick-up. The silk screen contains one hundred (100) holes per square inch, each hole being one-sixteenth ($\frac{1}{16}$) inch diameter. The impregnated, imprinted pad is dried for fifteen (15) minutes at 250° Fahrenheit and is then sterilized under steam for twenty (20) minutes at 250° Fahrenheit. The filter paper is then cut into one (1) inch by one-quarter ($\frac{1}{4}$) inch strips, each strip containing one and one-half percent (1.5%) Stryphnon·HCl by weight of the weight of the absorbent backing.

The strips are tested for hemostatic activity on a dog by applying them to a small cut. The strips, on being moistened by the blood, adhere to the skin on contact. When the patches are removed after one (1) minute, bleeding has ceased and the wound site is clean of blood, the same having been absorbed by the patch.

Although several specific examples of the inventive concept have been described, the same should not be construed as limited thereby to the specific features mentioned therein, but to include various other equivalent features and should be limited only in accordance with the claims appended hereto. It is understood that any suitable changes may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A patch for application to small cuts to prevent bleeding comprising a dry absorbent sheet impregnated with a vasoconstrictor and containing on at least one surface an adhesive, said adhesive being present in an open pattern extending across at least a large portion

of said sheet inward of its periphery leaving numerous adhesive free areas distributed over the surface of said patch whereby, when said patch is adhesively applied to a bleeding cut, blood from the cut is absorbed by the adhesive free areas of said sheet and effects the release of said vasoconstrictor from said sheet into said cut to thus retard further bleeding.

2. The patch of claim 1 wherein said open pattern of adhesive covers less than 90% of the surface area of the patch.

3. The patch of claim 2 wherein said vasoconstrictor is present on the patch in an amount greater than 1 milligram per square inch of the surface area of the absorbent sheet material.

4. The patch of claim 3 in which the adhesive is a moisture activatable adhesive.

5. The patch of claim 4 in which the moisture activatable adhesive is chosen from the group consisting of polyvinyl alcohol, polyvinyl acetate, and methyl cellulose.

6. The patch of claim 5 wherein said vasoconstrictor is methylaminoacetocatechal.

7. The patch of claim 3 in which said adhesive is a pressure sensitive adhesive.

8. A patch for application to small cuts to prevent bleeding comprising an absorbent sheet containing on one surface thereof a mixture of a vasoconstrictor and a dry moisture activatable adhesive, said mixture of vasoconstrictor and adhesive being present in an open pattern extending across at least a large portion of said sheet inward of its periphery leaving numerous adhesive free areas distributed over the surface of said patch whereby,

when said patch is applied to a bleeding cut, the blood from the cut activates said remoistenable adhesive and effects release of said vasoconstrictor into said cut to thus retard further bleeding while blood from the cut is absorbed by the adhesive free areas of said sheet.

9. The patch of claim 8 wherein said open pattern of adhesive covers less than 90% of the surface area of the patch.

10. The patch of claim 9 wherein said vasoconstrictor is present on the patch in an amount greater than 1 milligram per square inch of the surface area of the absorbent sheet.

11. The patch of claim 10 in which said moisture activatable adhesive is chosen from the group consisting of polyvinyl alcohol, polyvinyl acetate, and methyl cellulose.

12. The patch of claim 11 in which said vasoconstrictor is methylaminoacetocatechal.

13. A patch for application to small cuts to prevent bleeding of claim 1 in which said patch contains an area at the periphery free of adhesive whereby the removal of the patch from the surface of the wound is facilitated.

14. The patch of claim 13 where said adhesive free area at the periphery is a tab like appendage.

References Cited

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ADELE M. EAGER, *Primary Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,342,183

September 19, 1967

Martin Edenbaum

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 75, for "Hcl" read -- HCl --; column 4, line 6, for "bleding" read -- bleeding --; line 10, for "Hcl" read -- HCl --; column 5, line 9, for "les" read -- less --; column 5, line 28, strike out "dry" and insert the same after "a", first occurrence, in line 27, same column 5.

Signed and sealed this 29th day of October 1968.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents