April 22, 1952 A. P. PATCH 2,593,599

FOUNTAIN PEN WITH POROUS WRITING NIB AND RESERVOIR FILLED WITH ABSORBENT MATERIAL

Filed Sept. 13, 1946

FIG. 1.

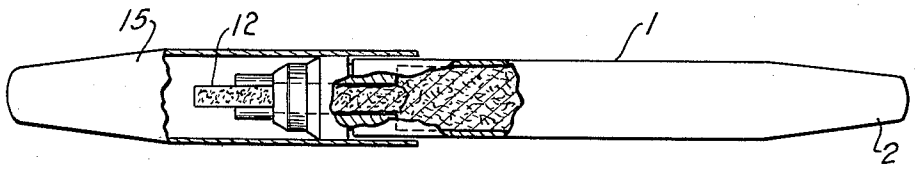


FIG. 2.

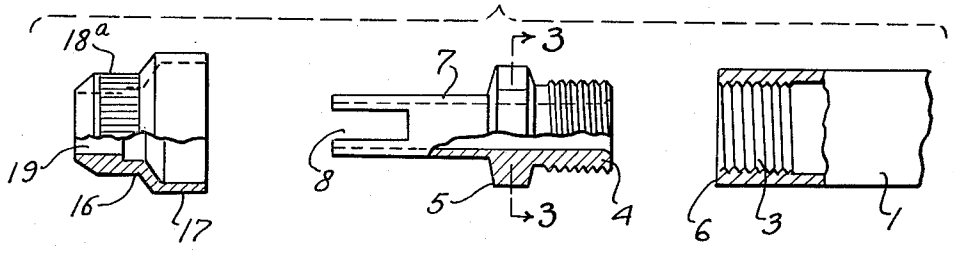


FIG. 3.

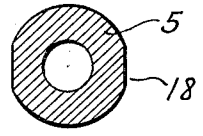
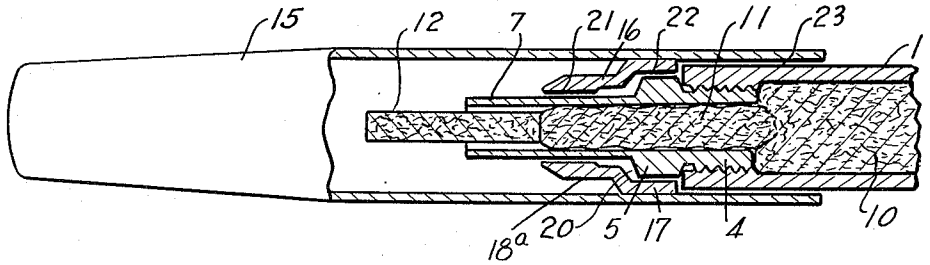


FIG. 4.



INVENTOR.
Anthony P. Patch
BY
Barnes, Kisselle, Raughlin & Raisch
ATTORNEYS

Patented Apr. 22, 1952

2,593,599

UNITED STATES PATENT OFFICE

2,593,599

FOUNTAIN PEN WITH POROUS WRITING NIB AND RESERVOIR FILLED WITH ABSORBENT MATERIAL

Anthony P. Patch, Detroit, Mich., assignor, by mesne assignments, to Dri-Flo Manufacturing Co., Hazel Park, Mich., a corporation of Michigan

Application September 13, 1946, Serial No. 696,688

1 Claim. (Cl. 15—134)

1

This invention relates to pens and it has to do particularly with pens of the fountain type.

In pens of the type which employ a solvent which is relatively highly volatile, difficulty is experienced with what is termed "sweating." The solvent, carrying coloring or pigment with it, escapes through joints. When this joint is covered by a cap, the air cannot reach the joint and therefore the colored solvent runs over some of the surfaces and discolors the same. This is, of course, odjectionable and the general purpose of this invention is to provide an improved pen structure which will overcome this objectionable sweating characteristic.

One pen which has this characteristic is a pen where the ink is absorbed by a fibrous filler within the barrel of the pen and where the writing instrument or nib is, itself, a fibrous element, such as a piece of felt. Such pens have many uses as, for example, in the writing of addresses in mailing departments and in other commercial establishments. Accordingly, such a pen is selected herein for the disclosure of the invention. In carrying out the invention, novel structure is embodied whereby the air has access to the location or locations where the sweating is liable to occur so that the volatile solvent is evaporated immediately at the joint or location of the sweating action with the result that the coloring material is not carried over or onto exterior surfaces.

Fig. 1 shows a pen constructed in accordance with the invention and has parts cut away and some parts of its structure in cross section.

Fig. 2 is a view of several of the parts in separated relationship.

Fig. 3 is an enlarged sectional view taken on line 3—3 of Fig. 2 showing some of the dimensions and clearances in exaggerated manner.

Fig. 4 is an enlarged cross sectional view showing structural features and vent passages.

As illustrated in Fig. 1, the pen comprises a body or barrel 1 which is closed at one end as shown at 2. At its other end, it is provided with internal threads 3. A closure and nib holder 4 is of hollow form having a threaded end arranged to be received by the internal threads 3 and it has an intermediate enlargement 5 for abutment against the end portion 6 of the barrel. This nib holder has an extension 7, the end of which is slotted as at 8.

When these pen parts are assembled as shown in Figs. 1 and 4, the barrel is substantially filled with an absorbent fibrous material such as a felt 10. There is also a filler of similar material 11 in the nib holder 4, one end of which contacts

2

with the felt 10 in the barrel while a nib of suitable material, such as felt, as illustrated at 12, is disposed within the slot 8 and it contacts with the filler 11. In use, the nib 12 is used as the writing instrument per se and the ink flows thereto through the fibrous substances, probably by capillary action. A cap for the pen is illustrated at 15 and this cap is impervious so as to prevent access of air generally to the nib.

It has been found that a pen thus constructed has a sweating action at the location of the joint where the enlargement 5 abuts the barrel end 6. Due to the highly volatile nature of the solvent, there is such a rapid evaporation when the cap is removed that no discoloring of the adjacent parts occurs. However, when a cap is placed upon the barrel and it cuts off air from access to this joint, the sweating solvent flows over the surface and there is a resultant objectionable coloring.

To meet this situation, an element which may be termed a ferrule, generally shown at 16, is mounted on the holder 4. This ferrule has an enlarged portion 17 which is press fitted or otherwise fixedly mounted on the enlargement 5 of the holder. For the purpose of the passage of air through this pressed fit joint, the enlarged portion 5 is provided with one or more flats 18. A smaller portion of the ferrule, as illustrated at 18*a*, may be knurled for gripping the same and this smaller portion has an internal bore 19 which fits over the extension 7.

When the ferrule is applied to the holder, the connection is relatively permanent. The interior surfaces of the ferrule and the exterior surfaces of the holder are such that an internal chamber 20 is provided as shown in Fig. 4. Also, the walls of the internal bore 19 fit loosely on the extension 7 so that there is an unsealed joint or air passageway 21. The passage or passages provided by the one or more flats 18 is illustrated at 22. The enlarged portion 17 of the ferrule is preferably of slightly larger diameter than that of the barrel 1 so that when the cap 15 is applied thereto, the skirt of the cap does not seal against the wall of the barrel but is slightly spaced therefrom thus providing a clearance space or passage 23.

As mentioned above, if the cap is not applied to the pen, there is no objectionable sweating because the highly volatile nature of the solvent is such that it evaporates instanter and does not carry the coloring over the surfaces of the barrel or over other parts. When the cap 15 is applied to the structure of this invention, the objectionable coloring due to the sweating, is likewise overcome. It will be seen by

reference to Fig. 4, that any ink which sweats or is emitted at the joint between the end of the barrel and the enlargement 5 seeps into the space 23. However, this is not a sealed space and there is an adequate supply of air which can pass into and out of the space for evaporating the solvent immediately at the joint. Thus, the coloring material is not carried over the surfaces of the barrel nor, for that matter, deposited on the interior walls of the cap.

It has also been found that sweating will occur at the small end of the ferrule and to overcome this, the slight clearance at 21 is provided. Inasmuch as the clearance or space 21 communicates with the chamber 20, the sweating action occurs in the space 21 and in the chamber 20. It may be that the small space 21 is such that the sweating ink moves into the same by capillary action, and then as it passes into the larger chamber 20, the solvent is evaporated by the air which has access thereto through the passages 22 and 23. Whatever be the action, it is found that the construction thus described effectively overcomes the deposit of coloring material on the surfaces due to sweating.

I claim:

A fountain pen comprising, a barrel having an open end, a holder secured to the open end of the barrel and forming a joint therewith, said holder having a passage therethrough, a nib of porous material mounted in the passage of the holder and projecting from the end thereof, the barrel being packed with absorbent material for containing ink with the absorbent material contacting the nib, said solder having an enlarged part adjacent the end of and outside the barrel, a ferrule surrounding the holder and having an internally enlarged end portion fitted on the enlarged part of the holder to be carried thereby with portions of the interfitting surfaces of said end portion and said enlarged part having clearance relative to each other to provide

a passage, interior surfaces of the other end of the ferrule being free of the holder to provide a passage, the intermediate interior surfaces of the ferrule being spaced from the holder to provide a chamber between said two passages, said passages and chamber being in communication with each other, and a cap adapted to be mounted on the enlarged end of the ferrule and to telescope over the end portion of the barrel, the internal diameter of the cap being greater than that of the end portion of the barrel, to provide a passage therebetween which is in communication with the passage between the enlarged part of the holder and the internally enlarged end of the ferrule, whereby when the cap is in position, all of said passages and said chamber are in communication with the atmosphere.

ANTHONY P. PATCH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
426,622	Madden	Apr. 29, 1890
566,558	Bell	Aug. 25, 1896
631,824	Robinson	Aug. 29, 1899
1,173,865	Ries	Feb. 29, 1916
1,514,519	Harris	Nov. 4, 1924
1,938,314	Bromer	Dec. 5, 1933
2,097,496	Lunzer	Nov. 2, 1937
2,107,424	Platt	Feb. 8, 1938
2,416,596	Rosenthal	Feb. 25, 1947

FOREIGN PATENTS

Number	Country	Date
167,843	Germany	of 1906
515,113	France	of 1921