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Oct. 17, 1933. G. W. FITZ 1,931,344

MICROPINCETTE

Filed Aug. 21, 1931

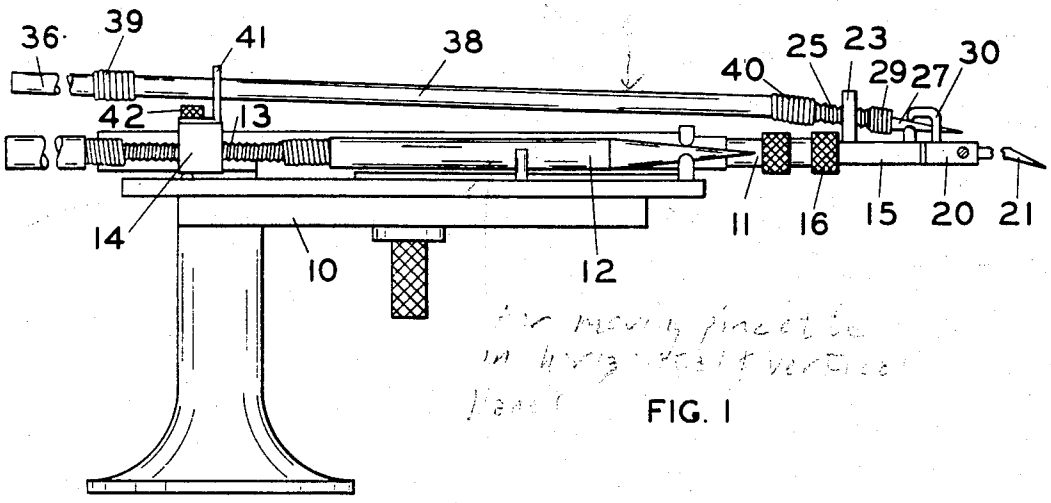


FIG. 1

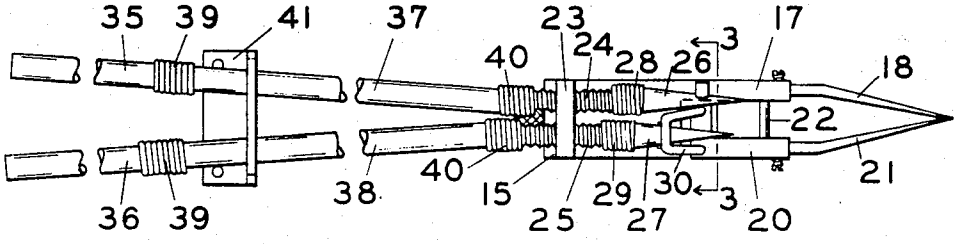


FIG. 2

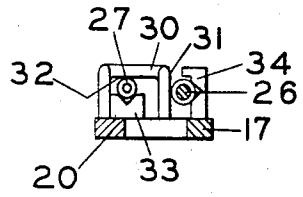


FIG. 3

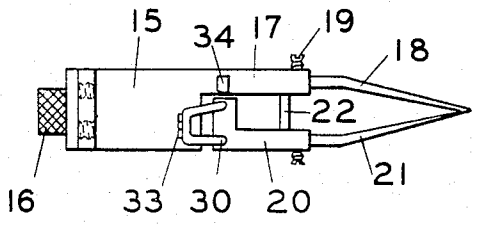


FIG. 4

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OPTICS

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MICROPINCETTE

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6 Claims. (Cl. 88—40)

This invention relates to micro-manipulators and more particularly it has reference to a pincette which is used in conjunction with a micro-manipulator for handling, manipulating and holding various objects and bits of material so that they may be observed and studied under a microscope.

One of the objects of my invention is to provide an improved pincette for use with a micro-manipulator. Another object is to provide a pincette having jaws which may be readily controlled by minute movements which are effected smoothly and positively. A further object is to provide means on a pincette of the character described so that it may be detachably secured to a micro-manipulator. Other objects are to provide a pincette having screw actuated cam surfaces for producing relative movement of the pincette jaws and to provide flexible, resilient, connecting means between the operating handles and the jaw actuating devices. These and other objects and advantages reside in certain novel features of construction, arrangement and combination of parts as will hereinafter be more fully described and pointed out in the appended claims:

Referring to the drawing:

Fig. 1 is a side elevation of one type of micro-manipulator showing my improved pincette attached thereto.

Fig. 2 is a top plan view of my pincette, showing it detached from the micro-manipulator.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a top plan view of the pincette with the screws and cam members removed.

One embodiment of my invention is disclosed in the drawing, Fig. 1 of which shows my improved pincette attached to a micro-manipulator of the type described in my U. S. Patent No. 1,859,823 issued May 24, 1932. The micro-manipulator comprises a support 10 on which is movably mounted a connector 11 to which suitable micro-tools or micro-pipettes may be detachably secured. The connector 11 can be moved, by minute amounts, in horizontal and vertical planes by means of tapered rods or cam members 12 which are actuated by means of screw 13 threaded in block 14. The connector 11 can also be moved longitudinally by means of a differential screw device, not illustrated.

My improved pincette, shown in Fig. 2, comprises a base member 15 having affixed thereto a connector 16 which is adapted to fit onto the connector 11 of the micro-manipulator. The base 15 has a forwardly projecting portion 17 to which a jaw 18 of suitable shape and material is detachably secured by means of screw 19. An L-shaped member 20, carrying detachable jaw 21, is secured to the portion 17 by means of a connecting pin 22. The pin 22 is fixedly secured to both the member 20 and the portion 17 but the single connection between the two parts and the resiliency of the members permits of relative movements between the parts 17 and 20 and, consequently, between jaws 18 and 21.

Mounted on base 15 is the block 23 into which are threaded the screws 24 and 25 connected, respectively, to the tapered cam members 26 and 27 by the flexible, resilient coil springs 28 and 29. Fixedly secured to member 20 is a bracket 30 having a vertical edge 31 and a horizontal edge 32. Cam member 27 rests in a V groove in block 33 on base 15 and its upper surface bears against the edge 32, whereas cam 26 is positioned in a V groove in post 34 secured to portion 17 of base 15 and contacts with the vertical edge 31 of bracket 30. Suitable operating handles 35 and 36 are connected, respectively, to screws 24 and 25 by means of rods 37 and 38 and flexible coil springs 39 and 40. The rods 37 and 38 are rotatably supported in a bracket 41 which is detachably secured to block 14 of the micro-manipulator by means of screw 42.

From the foregoing it will be apparent that when cam member 27 is advanced to the right, as seen in Fig. 2, the upper surface of cam 27 will have a camming action on edge 32 and will urge bracket 30 upwardly. This will cause the movable jaw 21 to move downwardly since the pin 22 serves as a turning point. When the cam 27 is moved in the opposite direction the jaw 21 will move upwardly due to the resiliency of the parts. Similarly when cam 26 is moved to the right it exerts a camming action on edge 31 and causes bracket 30 to move outwardly and this causes jaw 21 to move in toward the fixed jaw 18. The pincette can, of course, be moved as a unit by the operating handles of the micro-manipulator.

Hence it will be apparent that I have provided an improved pincette having means for producing a relative movement between the jaws. The movement can be effected in minute amounts and the action is smooth, positive and free from backlash. The operating handles of the pincette are located adjacent to the operating handles of the micro-manipulator and hence afford great convenience. The operating han-

dles of the pincette are connected to the pincette by means of flexible, resilient means so that the jarring and disturbance, caused by touching the handles, is not transmitted to the pincette which holds the object that is under examination.

Various modifications can obviously be made without departing from the spirit of my invention as pointed out in the appended claims.

I claim:

1. A micro-pincette for a micro-manipulator comprising a base, a pair of coacting jaws mounted on said base and cam means for effecting minute relative movement between said jaws in different planes.

2. A micro-pincette comprising a base, a pair of coacting jaws mounted for relative movement on said base, means for effecting a relative movement between said jaws, said means comprising a cam member and a handle operatively connected thereto by resilient, flexible means.

3. A pincette comprising a base, a fixed jaw secured to said base, a second jaw movably mounted on said base and adapted to coact with said fixed jaw, cam means for moving said second jaw in a vertical plane and cam means for moving said second jaw in a horizontal plane.

4. A pincette comprising a base, a fixed jaw secured to said base, a second jaw movably mounted on said base and adapted to coact with said fixed jaw and means for moving said second jaw in different planes, said means comprising a tapered cam member and a screw for moving said member.

5. A micro-manipulator having in combination a connector, means for moving said connector in different planes, operating handles for actuating said means, a micro-pincette detachably secured to said connector, said pincette having relatively movable jaws, a handle for moving one of the jaws, said handle being positioned adjacent to said first named handles so that all of said handles are within the grasp of the fingers of the hand.

6. A micro-pincette comprising a base, relatively movable jaws mounted on said base, means for moving one of said jaws comprising a cam member, a screw movably mounted on said base, an operating handle and resilient, flexible connecting means between the handle and screw and between the screw and the cam member.

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