

[54] SIMPLIFIED UNIDIRECTIONAL TWIST-UP DISPENSING DEVICE WITH INCREMENTAL DOSING

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[58] Field of Search 401/174, 194, 401/288, 266, 172

[56] References Cited

U.S. PATENT DOCUMENTS

Re. 30,659	6/1981	Otake et al.	401/209
D. 175,548	9/1955	Kane	D9/2
D. 299,973	2/1989	Campello et al.	D28/7
D. 306,354	2/1990	Konose	D28/7
D. 306,355	2/1990	Shinohara	D28/7
D. 306,914	3/1990	Shinohara	D28/7
D. 318,538	7/1991	Shinohara	D28/7
D. 325,264	4/1992	Shinohara	D27/7
D. 330,442	10/1992	Fukazawa	D28/7
D. 353,397	12/1994	Banik	D19/66
835,606	11/1906	Frimand .	
1,599,660	9/1926	Little et al. .	
1,644,173	10/1927	Carr .	
1,919,859	7/1933	Phillips .	
1,950,324	3/1934	Powers	206/56
1,994,890	3/1935	Kallenbach	15/133
2,068,213	1/1937	Wilson	15/134
2,094,700	10/1937	Gunn	221/60

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

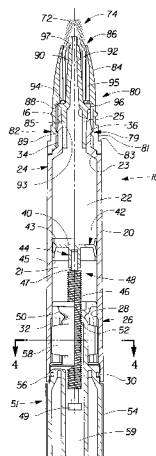
0258799	8/1987	European Pat. Off.	B65D 83/00
0434326A1	12/1990	European Pat. Off.	B65D 83/00
2623-426-A	5/1989	France .	
2 198 037	6/1988	United Kingdom .	
2229791	10/1990	United Kingdom	401/174
2 208 471	3/1991	United Kingdom .	
2 211 081	7/1991	United Kingdom .	
WO			
91/015135 A1	3/1991	WIPO	A45D 34/04
9115135	10/1991	WIPO	401/174

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[57] ABSTRACT

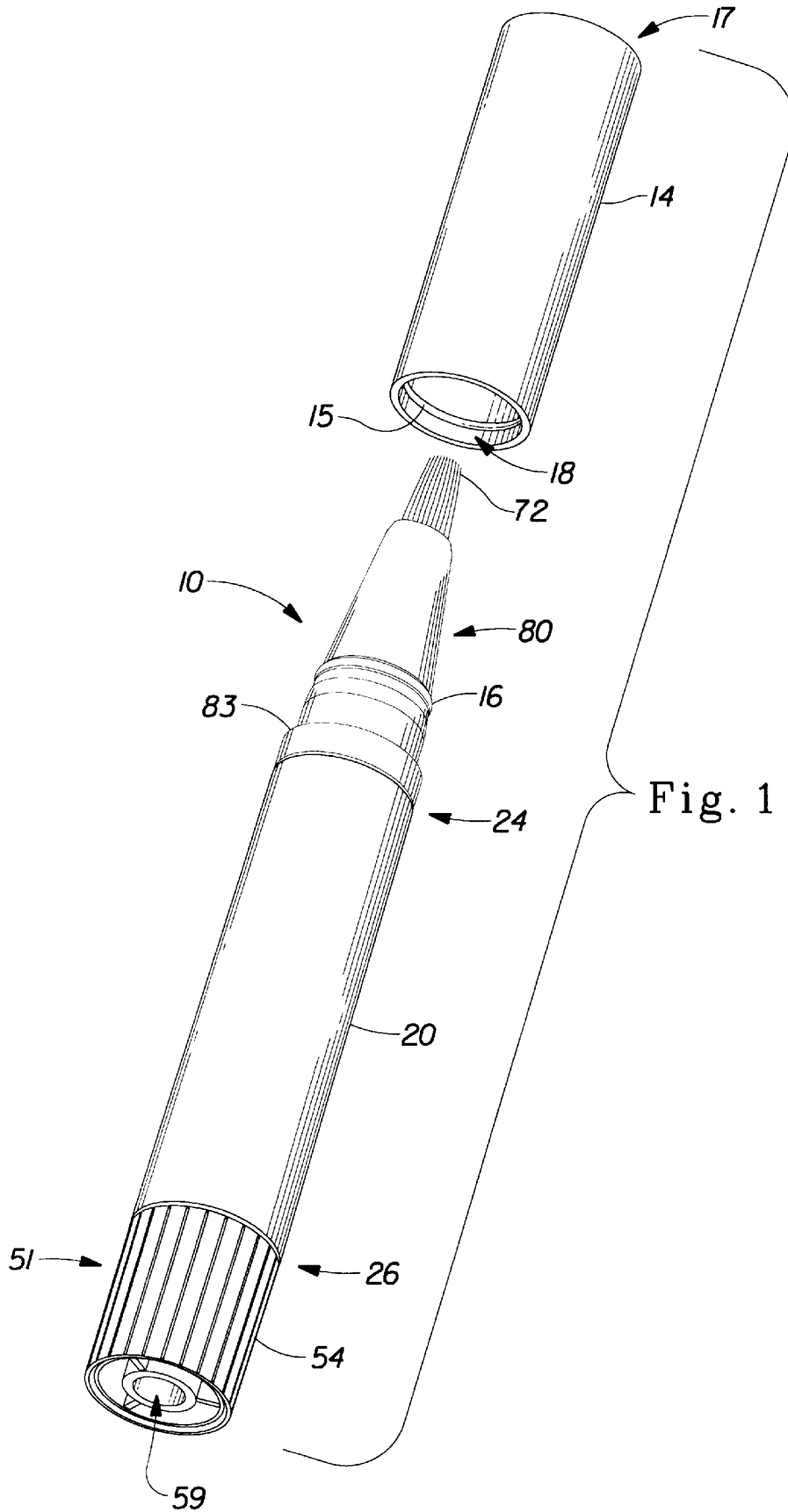
A unidirectional twist-up dispensing device with incremental dosing for dispensing a product is provided. This twist-up dispensing device includes a hollow housing defining a chamber having an open dispensing end and an open actuating end having a interior surface. A piston located within the chamber being limited to translational movement within the chamber. The piston having a top side facing the dispensing end of the housing forming a variable volume portion of the chamber for storing the product. The piston also having a threaded rod extending therefrom opposite the top side. An actuator having a threaded aperture there-through that engages the interior surface at the actuating end of the housing is also provided. The threaded aperture is concentric in the actuator and the actuator is adapted to rotate with respect to the housing in only one direction. The threaded rod engages the threaded aperture such that advancement of the piston toward the dispensing end occurs when the actuator is rotated, thereby causing the product to be dispensed. An applicator can be attached to the dispensing end of the housing in fluid communication with the variable volume portion of the chamber wherein the product is dispensed through the applicator. The applicator comprises a ferrule and an application portion. The ferrule is attached to the dispensing end of the housing and the application portion has at least one orifice located therein. Several versions of the applicator are illustrated, including a fiber brush and a flocked application surface.

17 Claims, 6 Drawing Sheets



U.S. PATENT DOCUMENTS

2,196,379	4/1940	Bender	221/79	4,795,218	1/1989	Seidler	300/21
2,309,861	2/1943	Mureau	15/137	4,844,250	7/1989	Holoubek et al.	222/107
2,314,539	3/1943	Hollenbeck	15/139	4,856,925	8/1989	Konose	401/290
2,374,065	4/1945	Worthington	15/137	4,865,231	9/1989	Wiercinski	222/390
2,442,503	6/1948	Melnikoff	132/88.7	4,874,117	10/1989	Kay et al.	222/487
2,604,104	7/1952	Kruck	132/88.7	4,887,924	12/1989	Green	401/261
2,629,889	3/1953	Lengyel	15/137	4,946,302	8/1990	Uchida	401/288
2,763,881	9/1956	Riel	15/137	4,954,000	9/1990	Gueret	401/68
2,816,309	12/1957	Worth et al.	15/137	4,961,663	10/1990	Iwamoto et al.	401/78
2,908,925	10/1959	Reitknecht	15/137	4,966,479	10/1990	Idec et al.	401/68
2,913,748	11/1959	Felter	15/139	4,978,242	12/1990	Konose	401/129
2,917,765	12/1959	Jakubowski	15/137	4,987,911	1/1991	Powers	132/320
3,002,517	10/1961	Pitton	132/85	4,997,299	3/1991	Ohba	401/75
3,212,120	10/1965	Gentile	15/558	5,000,356	3/1991	Johnson et al.	222/391
3,226,762	1/1966	Norman	15/558	5,007,754	4/1991	Zierhut	401/174
3,369,543	2/1968	Ronco	128/269	5,007,755	4/1991	Thompson	401/175
3,459,482	8/1969	Fears	401/15	5,011,317	4/1991	Gueret	401/66
3,468,612	9/1969	Aston	401/174 X	5,019,033	5/1991	Geria	604/2
3,481,676	12/1969	Schwartzman	401/134	5,026,195	6/1991	Kimura	401/283
3,756,730	9/1973	Spatz	401/174	5,035,525	7/1991	Konose	401/278
3,771,166	11/1973	Tuilos	346/140	5,042,955	8/1991	Moscatelli	401/269
3,807,881	4/1974	Seidler	401/175	5,073,057	12/1991	Lathrop et al.	401/206
3,825,021	7/1974	Seidler	132/88.7	5,085,352	2/1992	Sasaki et al.	222/327
3,850,531	11/1974	Ackermann	401/65	5,097,853	3/1992	Nehashi	132/320
3,881,828	5/1975	Jones	401/199	5,119,838	6/1992	Nakazima	132/108
3,917,417	11/1975	Lang	401/72	5,123,431	6/1992	Wilson	132/320
3,942,903	3/1976	Dickey et al.	401/198	5,124,205	6/1992	Raynolds et al.	428/364
4,119,756	10/1978	Midorikawa	428/295	5,131,773	7/1992	Gueret	401/68
4,139,127	2/1979	Gentile	222/390	5,137,388	8/1992	Kimura	401/278
4,201,491	5/1980	Kohler	401/264	5,176,461	1/1993	Kimura	401/279
4,384,589	5/1983	Morris	132/88.5	5,234,136	8/1993	Kopis	222/391
4,421,809	12/1983	Bish et al.	428/90	5,255,990	10/1993	Dornbusch et al.	401/68
4,446,965	5/1984	Montiel	206/205	5,299,877	4/1994	Birden	401/206
4,551,038	11/1985	Baker et al.	401/265	5,320,442	6/1994	Yanagisawa et al.	401/172
4,595,124	6/1986	Duval et al.	222/39	5,372,444	12/1994	Lhuisset	401/175
4,622,985	11/1986	Jankewitz	132/88.5	5,396,913	3/1995	Wallschlaeger	132/320
4,624,594	11/1986	Sasaki et al.	401/176	5,401,112	3/1995	Dornbusch et al.	401/68
4,708,267	11/1987	Sieverding et al.	222/211	5,454,660	10/1995	Sakurai et al.	401/266
4,749,618	6/1988	Kawaguchi et al.	428/375	5,478,552	12/1995	Hasegawa	424/63
4,762,433	8/1988	Bergeson et al.	401/206	5,480,250	1/1996	Birden	401/199
				5,556,215	9/1996	Hori	401/199



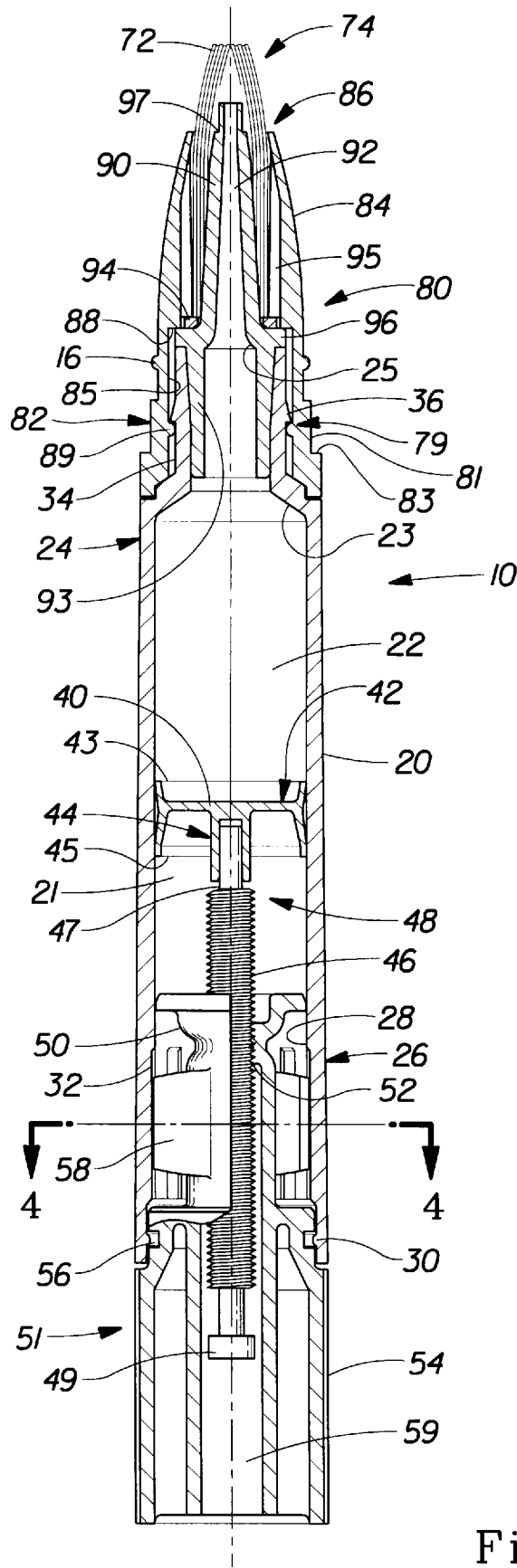


Fig. 2

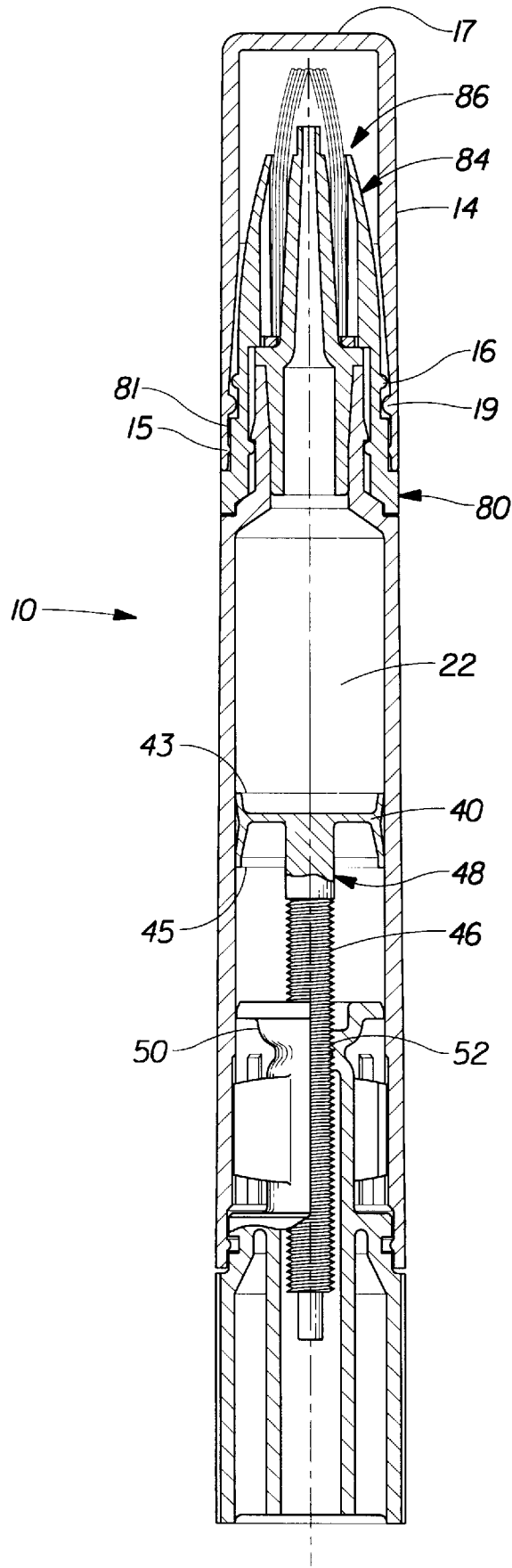


Fig. 3

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