



US005921963A

United States Patent [19]

[11] Patent Number: **5,921,963**

Erez et al.

[45] Date of Patent: ***Jul. 13, 1999**

[54] **SKIN PIERCING DEVICES FOR MEDICAL USE**

4,919,134	4/1990	Streeter	128/400
4,930,956	6/1990	Mantovani .	
5,066,288	11/1991	Deniega	604/274
5,130,815	7/1992	Silverman et al. .	
5,147,375	9/1992	Sullivan	606/182
5,318,547	6/1994	Altschuler	604/198
5,339,166	8/1994	LeBrat et al. .	
5,578,014	11/1996	Erez et al.	604/192

[75] Inventors: **Uri Erez, Kiryat Motzkin; Yuval Singer, Haifa, both of Israel**

[73] Assignee: **Mali-Tech Ltd., Haifa, Israel**

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/697,293**

[22] Filed: **Aug. 26, 1996**

FOREIGN PATENT DOCUMENTS

378042	7/1990	European Pat. Off. .
540403	5/1993	European Pat. Off. .
3325046	1/1985	Germany .
3320364	2/1985	Germany .
677633 A5	6/1991	Switzerland .
2101795	1/1983	United Kingdom .

Related U.S. Application Data

[63] Continuation of application No. 08/325,412, Dec. 30, 1994, Pat. No. 5,578,014, and application No. PCT/US93/03992, Apr. 28, 1993.

[30] Foreign Application Priority Data

Apr. 29, 1992	[IL]	Israel	101720
Jan. 8, 1993	[IL]	Israel	104350

[51] **Int. Cl.⁶** **A61M 5/00**

[52] **U.S. Cl.** **604/192**

[58] **Field of Search** 604/113, 110, 604/117, 187, 192, 198, 218, 263; 128/919; 606/167, 170, 172, 181, 182

[56] References Cited

U.S. PATENT DOCUMENTS

2,536,001	6/1950	Chase	62/91.5
2,674,246	4/1954	Bower	604/198
3,134,380	5/1964	Armao	604/198
3,605,742	9/1971	Tibbs	128/218
4,270,537	6/1981	Romaine	128/218
4,373,526	2/1983	Kling	128/215
4,564,054	1/1986	Gustavsson	604/198
4,600,281	7/1986	Bloomstein .	
4,613,328	9/1986	Boyd	604/156
4,646,737	3/1987	Seney	128/303.1
4,725,265	2/1988	Sairenji	604/112
4,775,369	10/1988	Schwartz	604/263
4,795,432	1/1989	Karczmer	604/198
4,801,295	1/1989	Spencer	604/198
4,863,436	9/1989	Glick	604/198

OTHER PUBLICATIONS

Call It Amazing, by Jum St. Lawrence in "Videography".
 Brochure from Dubner International, re Scene Stealer.
 Sony brochure re BVE-9100.
 Brochure from EVE, Espace Video Film in French and English.
 pp. 3-8 and Fig. 1 from handbook from TDF-CERIM-laboratoire Audiofrequence.
 Pamphlet entitled Project Aries Cahier Des Charges from Societe Aries.
 BYTE, vol. 18, No. 2, Feb. 1993, pp. 225-228 and 230, Davis, et al, The Mac Goes to the Movies.
 Proceedings of the International Conference On Data Engineering, Vienna, Apr. 19-23, 1993, No. Conf. 9, IEEE, pp. 381-390, Gibbs, et al., Audio/Video Databases: An Object-Oriented Approach.

Primary Examiner—John D. Yasko
Assistant Examiner—Manuel Mendez
Attorney, Agent, or Firm—Ladas & Parry

[57] ABSTRACT

Apparatus for piercing skin including a skin contact surface arranged to contact a portion of skin to be pierced, a skin piercing needle arranged to pierce the skin within the region and a cooling assembly providing cooling of the skin contact surface thereby cooling the portion of skin prior to and during piercing thereof by the skin piercing needle.

10 Claims, 19 Drawing Sheets

