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(54) Title: SKIN TREATMENT APPARATUS AND METHOD

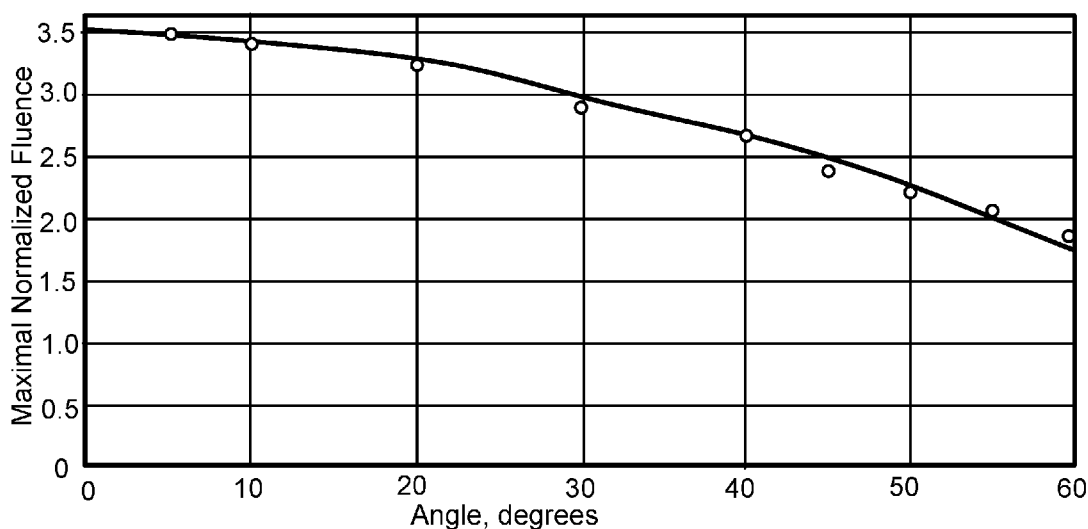


FIG. 4

(57) Abstract: A method and system for aesthetic skin treatment. The system includes a treatment energy source for generating a treatment beam and a treatment beam deflecting mechanism configured to direct the treatment beam to a treated skin area. One or more video cameras configured to capture a treated skin area and communicate captured treated skin area image to a processor. Based on a captured treated skin area the processor constructs a three-dimensional representation of the captured skin area and controls a treatment energy beam deflecting mechanism to deflect the treatment energy beam to follow the three-dimensional representation of the captured skin area.





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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61N 5/02, A61N 5/06, A61N 5/067, A61B 18/18, A61B 18/20 (2017.01)

CPC - A61B 2018/2095, A61B 2018/00464, A61B 2018/00452, A61B 2018/00642, A61B 2018/00684, A61B 2018/00791, A61N 5/0616, A61N 5/025, A61N 5/0625, A61N 2005/0627, A61N 2005/0628, A61N 2005/0665, A61N 2005/0666, A61B 5/01, A61B 5/015, A61B 5/441, A61B 5/4836, A61N 2005/067, A61B 18/203

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0063490 A1 (VERHAGEN et al.) 11 March 2010 (11.03.2010) Entire document, especially Abstract, para[0013], para[0045], para[0050]- para[0053] and FIG. 3.	1, 3, 5, 7-8, 10
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Y		2, 6, 9, 11-13
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A		4
Y	US 2015/0025513 A1 (TAGHIZADEH) 22 January 2015 (22.01.2015) Entire document, especially Abstract, para[0097], para[0108]- para[0110] and para[0143].	2, 9
Y	US 2013/0261606 A1 (ANDREW et al.) 03 October 2013 (03.10.2013) Entire document, especially Abstract, para[0042], para[0091].	6
Y	US RE37504 E (LIN) 08 January 2002 (08.01.2002) Entire document, especially Abstract, col 7, ln 49- col 8, ln 10.	11
Y	US 2013/0345541 A1 (NAU) 26 December 2013 (26.12.2013) Entire document, especially Abstract, para[0035]- para[0042].	12
Y	US 6,149,644 A (XIE) 21 November 2000 (21.11.2000) Entire document, especially Abstract, col 4, ln 24-39.	13
A	US 2008/0287930 A1 (RAPOPORT) 20 November 2008 (20.11.2008) Entire document, especially Abstract, para[0134], para[0140]- para[0149].	4
A	US 2015/0230863 A1 (YOUNGQUIST et al.) 20 August 2015 (20.08.2015) Entire document.	1-13

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL 17/50005

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: claims 1-13, drawn to a beam treatment system

Group II: claims 14-18, drawn to method using a beam treatment system with temperature control

The inventions listed as Groups I - II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

--- see extra sheet ---

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-13

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL 17/50005

----- Continuation of Box III: Observations where unity of invention is lacking (Continuation of item 3 of first sheet) -----

Group II includes the special technical features of method steps including particular use steps (claim 14) employing a temperature sensing device configured to sense a temperature of the skin area to be treated; and using a processor configured based on the temperature of the skin area to assess at least the temperature of adipose tissue located below the skin area to be treated, not required by Group I.

Group I-II are related to an apparatus (Group I) and method of using the apparatus (Group II). These groups therefore share the technical features of the apparatus of claim 1, however, these shared technical features fail to provide a contribution over the prior art of US 2010/0063490 A1 to Verhagen et al. (hereinafter: Verhagen). Verhagen describes a system (Abstract) comprising: at least one treatment energy source for generating a treatment beam (laser source 40, FIG. 3; para[0045]); at least one treatment beam deflecting mechanism configured to direct the treatment beam to a treated skin area (laser beam manipulator 48 with a mirror 46, FIG. 3; para[0045]); at least one video camera configured to capture a treated skin area and communicate captured treated skin area image (cameras 52/54, FIG. 3; para[0052]) to a processor (control unit, para[0013],[0053]; e.g. 44, FIG. 3, para[0045]); and a processor configured to construct, based on a captured treated skin area a three-dimensional representation of the captured treated skin area (para[0052]: 3D surface map) and wherein the processor is further configured to control a treatment beam deflecting mechanism to deflect the treatment beam to follow the three-dimensional representation of the captured skin area (para[0053]: on basis of ... surface map, control unit 4 aims laser; para[0050] describing the manipulator used for this aiming).

Thus, Groups I-II lack unity of invention because they do not share a same or corresponding special technical feature providing a contribution over the prior art.