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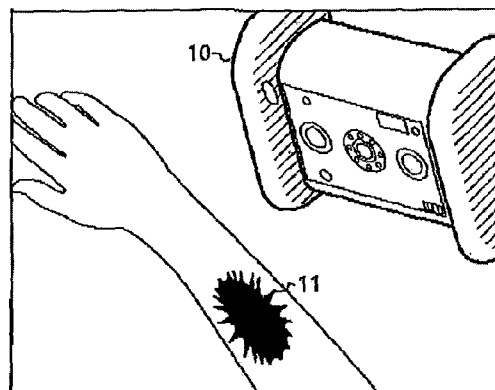
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(54) Title: SYSTEM FOR INTEGRATED WOUND ANALYSIS

Figure 1



(57) Abstract: A system for integrated wound analysis; said system including sensing and image recording elements; sensed data and images of at least a first recording session stored for analysis; said system including a reference system whereby sensing and image recording of any subsequent said recording session substantially repeats sensing and recording of parameters of said first recording session.

AMENDED CLAIMS
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CLAIMS

1. A wound monitoring device for integrated wound analysis; said device including sensing and image recording elements; sensed data and images of at least a first recording session stored for analysis; said system including a reference system whereby sensing and image recording of any subsequent said recording session substantially repeats sensing and recording of parameters of said first recording session; said sensing and image recording elements including a distance sensor; said distance sensor determining a distance between said device and a reference mark projected by said device onto a surface adjacent said wound.
2. The device of claim 1 wherein said recording parameters of said first recording session include location and disposition of said sensing and image recording elements relative a subject wound.
3. The device of claim 1 or 2 wherein said recording parameters further include ambient lighting and temperature of the recording environment.
4. The device of any one of claims 1 to 3 wherein said distance sensor establishes a distance parameter of said sensing and image recording elements for a said recording session.
5. The device of any one of claims 1 to 4 wherein said reference system includes said reference mark; said reference mark a laser projected onto a body portion adjacent said wound; an image of said projected reference mark stored for comparison with a

- projected reference mark of any said subsequent recording session.
6. The device of claim 5 wherein a projected image of said reference mark in a said subsequent recording session sensed by said imaging element is analysed by said system; said system indicating to a user when said projected image corresponds substantially with an image of said reference mark recorded in said first recording session.
 7. The device of any one of claims 1 to 6 wherein said sensing elements include temperature and ambient light sensors; said temperature and ambient light sensors establishing baseline parameters of said first recording session for comparison and adjustment of said parameters in any said subsequent recording session.
 8. The device of any one of claims 1 to 7 wherein said system compensates for ambient light conditions.
 9. The device of any one of claims 1 to 8 wherein said image recording elements include a digital camera.
 10. The device of claim 9 wherein said digital camera is provided with a thermal imaging capability; said thermal imaging recording temperatures of said wound corrected according to variations from said base line parameter of ambient temperature.

11. The device of any one of claims 1 to 10 wherein said system includes a view finder/display screen; said view finder/display screen acting in a first instance to display a subject wound sensed through a lens system of said digital camera; said display acting in a second instance to display simultaneously as a semi transparent overlay a previously recorded image of said subject wound and said subject wound sensed through said lens system.
12. The device of any one of claims 2 to 11 wherein recorded sensed and image data is analysed by said system; analysis of said recorded data providing an output of progress of a said subject wound displayed on said view finder/display screen.
13. The device of claim 11 or 12 wherein said view finder/display screen is further adapted to the display of recorded textual data relating to treatment of a said wound.
14. The device of any one of claim 11 to 13 wherein said sensing and said imaging elements and said view finder/display screen are incorporated in a single monitoring device.
15. The device of any one of claims 11 to 13 wherein said sensing elements, said imaging elements and said view finder/display screen are separate devices; said separate devices connected to a central data processing unit.
16. A method of monitoring a wound; said method including the steps of:

- (a) projecting a reference mark onto a surface area adjacent said wound,
 - (b) determining a distance between a sensing and recording device and said reference mark,
 - (c) establishing base line parameters of conditions under which parameters of said wound are recorded in a first sensing and image recording session,
 - (d) recording sensing and image data of said wound in subsequent sensing and image recording sessions,
 - (e) analysing differences between sensed and image data of a said subsequent sensing and image recording session with sensing and image data recorded in said first sensing and image recording session to derive an output of progress of said wound.
17. The method of claim 16 wherein said analysis is based on recorded temperature, colour and thermal imaging differences between said first recording session and said subsequent recording sessions.
18. The method of claim 16 or 17 wherein analysis and comparison of said sensing and image recordings of said first and subsequent recording sessions is provided by repeatability of parameters under which said sensing and image recording is conducted.
19. The method of any one of claims 16 to 18 wherein repeatability of orientation and disposition parameters of sensing elements and imaging elements is provided by comparison of an image of a said

projected reference mark with an image of said reference mark recorded in said first recording session.

20. The method of any one of claims 16 to 19 wherein repeatability of sensing and imaging conditions of ambient light and temperature is provided by comparison of ambient light and temperature in a said subsequent recording session with corresponding ambient light and temperature recorded in said first recording session; said ambient light and temperature recorded in a said subsequent recording session compensated to correspond to said ambient light and temperature of said first recording session.
21. A method of collecting an initial data set relating to a wound by use of a monitoring device; said method including the steps of:
 - (a) positioning said recording device over a wound to be monitored,
 - (b) using a view finder/display screen of said monitoring device to ensure said wound is within frame of said screen,
 - (c) said monitoring device measuring a distance between said device and a reference mark projected by said device onto a surface adjacent said wound,
 - (d) recording a digital visual three dimensional image and a thermal image of said wound.

22. A method of monitoring and analysing a wound over time; said method including the steps of:
- (a) projecting a reference mark onto a surface area adjacent said wound,
 - (b) determining a distance between a sensing and recording device and said reference mark,
 - (c) establishing a base line of wound parameters in an initial sensing and image recording session,
 - (d) repeating said sensing and image recording in subsequent sensing and recording sessions at predetermined intervals,
 - (e) analysing changes in status of said wound by comparison of said subsequent sensing and recording sessions with said base line wound parameters and preceding sensing and recording sessions.
23. The method of claim 22 wherein said monitoring is by means of a sensing and image recording device; said device including at least a digital camera for recording visual three-dimensional and thermal images of said wound.
24. The method of claim 23 wherein said device further includes a laser source projector; said laser source projector projecting a said reference mark onto a surface adjacent said wound.
25. The method of claim 24 wherein said laser source projector is configured for cauterising infected portions of said wound.

26. The method of any one of claims 22 to 25 wherein analysis of said wound includes monitoring changes in topography of a surface of said wound over a monitoring period.
27. A system for integrated site analysis; said system including sensing and image recording elements; sensed data and images of at least a first recording session stored for analysis; said system including a reference system whereby sensing and image recording of any subsequent said recording session substantially repeats sensing and recording of parameters of said first recording session; said sensing and image recording elements including a distance sensor; said distance sensor determining a distance between a sensing and image recording device and a reference mark projected by said device onto a surface adjacent said site.
28. The system of claim 27 wherein said recording parameters of said first recording session include location and disposition of said sensing and image recording elements relative a subject site.
29. The system of claim 27 or 28 wherein said recording parameters further include ambient lighting and temperature of the recording environment.
30. The system of any one of claims 27 to 29 wherein said distance sensor establishes a distance parameter of said sensing and image recording elements for a said recording session.
31. The system of any one of claims 27 to 30 wherein an image of said projected reference mark is stored for

comparison with a projected reference mark of any said subsequent recording session.

32. A method of monitoring a site; said method including the steps of:

- (a) projecting a reference mark onto a surface area adjacent said wound,
- (b) determining a distance between a sensing and recording device and said reference mark,
- (c) establishing base line parameters of conditions under which parameters of said site are recorded in a first sensing and image recording session,
- (d) recording sensing and image data of said site in subsequent sensing and image recording sessions,
- (e) analysing differences between sensed and image data of a said subsequent sensing and image recording session with sensing and image data recorded in said first sensing and image recording session to derive an output of progress of said site.

33. A method of collecting an initial data set relating to a site by use of a monitoring device; said method including the steps of:

- (a) positioning said recording device over a site to be monitored,
- (b) using a view finder/display screen of said monitoring device to ensure said site is within frame of said screen,

- (c) said monitoring device measuring a distance between said device and a reference mark projected by said device onto a surface adjacent said site,
- (d) recording a digital visual three dimensional image and a thermal image of said site.

34. A method of monitoring and analysing a site over time; said method including the steps of:

- (a) projecting a reference mark onto a surface area adjacent said site,
- (b) determining a distance between a sensing and recording device and said reference mark,
- (c) establishing a base line of site parameters in an initial sensing and image recording session,
- (d) repeating said sensing and image recording in subsequent sensing and recording sessions at predetermined intervals,
- (e) analysing changes in status of said site by comparison of said subsequent sensing and recording sessions with said base line site parameters and preceding sensing and recording sessions.

35. A system for integrated wound analysis; said system including sensing and image recording elements; said sensing including determining a distance between sensing elements of said system and said wound; sensed data and images of at least a

first recording session stored for analysis; said system further including a reference system whereby sensing and image recording parameters of any subsequent said recording session substantially repeats sensing and recording parameters of said first recording session; said system including at least a digital camera for recording visual three dimensional images of said wound.

36. The system of claim 35 wherein said digital camera includes a laser source projector; said laser source projector projecting a reference mark onto a surface adjacent to said wound.

37. The system of claim 36 wherein said laser source projector is configured for cauterising infected portions of said wound.

38. The system of any one of claims 35 to 37 wherein analysis of said wound includes monitoring changes in topography of a surface of said wound over a monitoring period.

39. The system of any one of claims 35 to 38 wherein said recording parameters of said first recording session include location and disposition of said sensing and image recording elements relative a subject wound.

40. The system of any one of claims 35 to 39 wherein said sensing elements include a distance sensor establishing a distance parameter of said sensing and recording elements for a said recording session.

41. The system of any one of claims 35 to 40 wherein said reference system includes a laser source projector for projection of a reference mark onto a body portion adjacent said wound; an image of said projected reference mark stored for comparison with a projected reference mark of any said subsequent recording session.
42. The system of any one of claim 35 to 41 wherein said digital camera includes a view finder/display screen; said view finder/display screen acting in a first instance to display a subject wound sensed through a lens system of said digital camera; said view finder/display screen acting in a second instance to display simultaneously as a semi transparent overlay a previously recorded image of said subject wound sensed through said lens system.
43. The system of claim 42 wherein recorded sensed and image data is analyzed by said system; analysis of said recorded data providing an output of progress of a said subject wound.
44. A system and device for monitoring and analysis of a wound over time as herein before described and with reference to the accompanying drawings.