Title: NAPPY WITH SOUND EMITTING APPARATUS
NAPPY WITH SOUND EMITTING APPARATUS

BACKGROUND
The present invention relates to novelty products and more particularly relates to a nappy or diaper adapted with a sound emitting apparatus. More particularly the invention relates to a sound emitting nappy/diaper which is capable of emitting sounds such as but not limited to musical tunes during nappy changing and upon application of a light finger force or pressure to an outer layer of the nappy.

PRIOR ART
Nappy changing is a time consuming activity which often irritates babies causing them to become restless and sometimes uncontrollable during nappy changes. It is estimated that each child on average undergoes up to 4000 nappy changes in its first years of life. There have been numerous variations and modifications to nappy designs attempting to make the activity of nappy changing more convenient. The early nappies were made of cloth necessitating a separate plastics cover or plastic over pants to separate a wet or soiled nappy from outer garments. These nappies are made generally from a cotton or cloth material and are folded over to increase the absorption by an increase in the number of layers between the inner and outer layers. The next generation of nappies are disposable and include an inner absorbent padding layer and an envelope of plastics providing a built in barrier to wetness, which keeps outer garments dry. The cloth nappies are usually washed and recycled whereas the disposable nappies are intended for single use. A third type of nappy is the pants type which are put on as pants and used for toilet training older children in the transition from babyhood to childhood. Beyond that, the main developments in nappy technology in recent times have been directed to nappy shape and nappy fastening for
securing the nappy wings and to allow ease of release for nappy changes. Most, if not all, technological developments in nappy construction have largely been implemented for the benefit of the person putting the nappy on. Developments have concentrated on fitting criteria of the nappy and production of an economic disposable nappy. None of these characteristics have any significant advantage or amusement value for the wearer such as a baby or young child during a nappy changing session. However, improvements in fitting techniques such as the use of adhesive tabs have significant advantages for the fitter as they decrease the fitting time. Although fitting times have been decreased by these developments, babies generally dislike the nappy changing process. Babies become restless easily and usually need to be amused during that process.

INVENTION

The present invention seeks to ameliorate the difficulty in management of a baby during the nappy changing process by providing an alternative nappy including a sound emitting device attached to or embedded in the nappy which will allow a person changing the nappy to initiate sound entertainment for a child to placate and amuse a child during nappy changes and to reduce or eliminate the possibility of disruption by a baby during nappy changes.

Throughout the specification a reference to nappy will also be taken as a reference to a diaper and will include single and multi layer nappies, reusable and disposable nappies and nappies of the trainer pants variety. All of these nappy types may be adapted with sound emitting apparatus to provide instant entertainment during nappy changes.

In one broad form the present invention comprises:
a nappy or diaper of the disposable or reusable type; the nappy/diaper comprising at least one layer of absorptive material;

a sound emitting device connected to or embedded in said at least one absorptive layer, whereupon sound from said sound emitting device is emitted spontaneously during fitting of the nappy or responsive to a finger force such as pressure, squeezing or pulling applied by a person fitting the nappy.

Preferably a pressure is applied to an outer surface of said nappy in the region of the sound emitting apparatus to initiate sound emission.

According to a preferred embodiment, the nappy comprises an inner absorptive layer and an outer plastics barrier layer, wherein the sound emitting device is located between the inner absorptive layer and said outer layer. According to an alternative embodiment, the sound emitting device is embedded in said absorptive layer.

Preferably, the sound emitting device is activated by pressure applied to a pressure switch, wherein said pressure is applied to an external layer of said nappy and transmitted to said sound emitting device. According to one embodiment, the sound emitted by said sound emitting device is a musical tune such as a nursery rhyme or the like.

In another broad form the present invention comprises;

a sound emitting device adapted for use in or on a nappy or diaper; wherein, when a child’s nappy is to be changed a person changing said nappy or diaper may initiate sound emitted by said sound emitting device by application of pressure to an outer layer of said nappy; wherein, the sound emitting device includes actuation means responsive to said pressure and a speaker for emitting said sound.
Preferably, said actuation means is operable through one or more layers of a nappy to which the device is attached.

In another broad form the present invention comprises:

a nappy including on an outer surface or embedded therein a sound emitting device,

wherein said sound emitting device is activated by applying pressure to said sound emitting device via an outer surface of said nappy.

In another broad form of a method aspect the present invention comprises:

a method of construction of a nappy comprising the steps of:

a) taking at least one layer of absorbent material;

b) forming a pocket in said at least one layer of absorbent material;

c) taking a sound emitting device and embedding said device in said pocket formed within said at least one absorbent layer;

According to a preferred embodiment, the method comprises the further step of enclosing said at least one absorptive layer in a waterproof plastics layer, to isolate said sound emitting device from physical contact with the skin of a wearer; but allowing actuation of said sound emitting device by applying pressure to a layer of said nappy in a region proximate the location of said sound emitting device.

Preferably, the nappy is constructed from an inner absorbent layer and an outer plastics barrier layer; wherein the pocket housing the sound emitting device is formed from the same or a different material from the layer to which said pocket is attached.

In another broad form of the method aspect the present invention comprises:

a method of construction of a nappy comprising the steps of:

a) taking an absorbent material and forming an inner absorbent layer of said nappy,
b) taking a sound emitting device and embedding said device in said absorbent layer,
c) taking a plastics material and covering said absorbent material and said sound emitting device with said plastics material to form an outer layer;
5 d) allowing means to activate said sound emitting device to be accessible from outside said plastics outer layer.

In another broad form of the method aspect the present invention comprises;

a) method of construction of a nappy comprising the steps of;

a) taking an absorbent material and forming an inner absorbent layer,

b) taking a plastics material and covering said absorbent material with said plastics material to form an outer barrier layer;

c) taking a sound emitting device and attaching said device to said barrier layer,

d) actuating said sound emitting device via pressure applied to an outer layer of said nappy.

15 According to one embodiment, the sound emitting device comprises a micro chip programmed with a predetermined musical tune and a mini speaker for emitting said sound upon pressure applied to an outer layer of said nappy.

The nappy is according to one embodiment disposable and is formed of two layers comprising an inner absorptive layer, and an outer layer which envelops said absorptive layer and which prevents liquid contact with an outer garment of a wearer, wherein the sound emitting device is held in a pocket on an inside surface of said outer layer to prevent contact between the sound emitting device and baby excrement or urine.
According to one embodiment, the sound emitting device is located in the nappy near the hip area of a wearer when the nappy is fitted.

According to an alternative embodiment, the sound emitting device located in the nappy near the upper thigh of a wearer when the nappy is fitted.

In another embodiment, the sound emitting device may be located in the nappy near connecting tabs which retain the nappy in position.

In a further embodiment, the sound emitting device may be located in the nappy near the navel hip area of a wearer when the nappy is fitted.

In yet a further embodiment, the sound emitting device is located in the nappy near the lower back area of a wearer when the nappy is fitted so that the sound is emitted by the weight of a baby.

In another broad form of the method aspect, the present invention comprises; a nappy or diaper of the type comprising an inner absorbent layer and an outer plastics layer characterised in that the nappy includes on one or other of the layers a sound emitting device.

In another broad form the present invention comprises; a sound emitting device adapted for use in or on a nappy or diaper; wherein when a child’s nappy is to be changed a person changing said nappy or diaper may initiate sound emitted by said sound emitting device.

DETAILED DESCRIPTION

The present invention will now be described in more detail according to preferred but non limiting embodiment and with reference to the accompanying illustrations wherein;
Figure 1 shows an exploded schematic perspective view of a nappy or diaper according to a preferred embodiment of the invention.

Figure 2 shows the nappy or diaper of figure 1 with sound emitting device located external of the inner absorptive layer 2; and

Figure 3 shows a nappy fitted to a baby with sound emitting device attached to the nappy.

Referring to figure 1 there is shown an exploded schematic perspective view of a typical disposable nappy 1 according to a preferred embodiment of the invention. Nappy 1 comprises an internal layer of an absorptive material 2 which is enveloped by external barrier layer 3. For fastening purposes nappy 1 includes fastening tabs 4 and 5 which, when the nappy is fitted engages wings 6 and 7.

The arrangement described in figure 1 is for the most part a conventional nappy. A conventional nappy of the disposable type will normally comprise an absorptive layer, which absorbs urine and solid waste, an inner layer which keeps the absorptive material in tact and a backing layer of usually plastics to provide a barrier preventing wetness or soil to penetrate to the outside in a manner which could damage outer garments.

According to the invention the nappy is adapted with a sound emitting device 8 which is embedded according to one embodiment in inner absorptive layer 2. For clarity nappy 1 is shown with layer 9 peeled back to expose a recess 10 suitable for receiving sound emitting device 8 embedded in the absorptive layer 2. Layer 9 will also be absorptive but has sufficient resilience to keep absorptive layer 9 in tact. Although sound emitting device is shown embedded in layer 2, it will be appreciated by persons skilled in the art that device 8 may be held in a plastics envelope separate
from absorptive layer 2 to prevent any contact between device 8 and urine or solid waste which could potentially react with the device.

Referring to figure 2 there is shown an alternative embodiment of the arrangement of figure 1. The arrangement of figure 2 differs from that of figure 1 in that the sound emitting device 8 is now shown on the outside of nappy 1 on layer 9. In this embodiment the sound emitting device 8 may be housed in an envelope protecting it from direct contact with a baby’s skin or from contact with any urine or solid waste. In the case where the sound emitting device 8 is between layers 9 and 3 embedded in layer 2, in order to activate sound emitting device 8 a user squeezes nappy 1 which will activate switching pressure pad 11. Sound is then emitted from speaker 12. Sound emitting device 8 may be deactivated by squeezing nappy 1 for a second time or alternatively pre programmed sound plays for a predetermined period following which the sound emitting device 8 is rendered silent. Further squeezing will reactivate the device. The location of the sound emitting device 8 as shown in figure 1 and 2 is purely illustrative. The device may be located at any convenient position in or on the nappy provided it does not interfere with the baby’s comfort. In this regard, the sound emitting device should not be in contact with a baby’s skin.

According to a preferred embodiment the sound emitting device is most appropriate for disposable nappies. The nappy may include a separate compartment within the absorbent internal layer and is invisible from the outside of the nappy. A user is guided to the location of the sound emitting device with in the nappy by indicia on the outside of the nappy at the location of the device. This enables a user to apply pressure to the nappy at the indicated location initiating sound emission. The music may be songs, nursery rhymes and any other form of sound entertainment. It is
anticipated that the activity of changing a baby’s nappy will be more pleasant as the baby can be entertained with music irrespective of the location at which the nappy is changed.

Referring to figure 3 there, is shown a nappy 20 of the disposable pants type including fixing tabs 20a and 20b and with a sound emitting device 21 attached. Sound emitting device 21 includes a speaker 22 for emitting sound such as but not limited to music and a switch 23. Switch 23 may be responsive to finger pressure applied by the person fitting the nappy. The location of the nappy shown in figure 3 is but one possible location only. It will be appreciated that the switch could be located at the rear of the nappy in which case it may be activated when the baby lies on the nappy, at the sides or indeed almost anywhere on the inside or outside of the nappy. According to one embodiment sound emitting device 21 is isolated from inner and outer layers which form nappy 20 to protect the wearer from unwanted contact with the device or the device from unwanted contact with liquid or solid waste products.

Device 21 may be restarted a potentially unlimited number of times but will normally be disposed of with the nappy. In the case where the sound emitting device is used on a reusable nappy the device may be protected in a plastics envelope including in the nappy material.

It will be recognised by persons skilled in the art that numerous variations and modifications may be made to the invention broadly described herein without departing from the overall spirit and scope of the invention.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A nappy or diaper of the disposable or reusable type; the nappy/diaper comprising at least one layer of material;

2. A sound emitting device connected to or embedded in said at least one layer, whereupon sound from said sound emitting device is emitted spontaneously or responsive to a user action or command.

3. A nappy/diaper according to claim 1 further comprising an inner absorptive layer and an outer plastics layer; wherein the sound emitting device is located between layers.

4. A nappy/diaper according to claim 2 wherein said sound emitting device is activated by pressure applied to a start switch or button.

5. A nappy according to claim 3 wherein said pressure is applied to an external layer of said nappy and transmitted to said sound emitting device.

6. A nappy according to claim 4 wherein there is provided indicia on the nappy to direct a user to a location to apply pressure to activate the sound emitting device.

7. A nappy according to claim 5 wherein sound emitted from said sound emitting device is a musical tune.

8. A sound emitting device adapted for use in or on a nappy or diaper; wherein said sound emitting device is activated when a child’s nappy is to be changed by a person changing said nappy or diaper; and wherein sound from said device may be initiated by said sound emitting device by application of pressure to a predetermined
region of said nappy; wherein the sound emitting device includes actuation means responsive to said pressure and a speaker.

9 A sound emitting device according to claim 8 wherein, said actuation means is operable through one or more layers of a nappy to which the device is attached.

5 10 A nappy or diaper of the disposable or reusable type including on an outer surface or embedded therein a sound emitting device, wherein said sound emitting device is activated by applying pressure to a surface of said nappy.

11 A method of construction of a nappy comprising the steps of;

a) taking at least one layer of absorbent material;

10 b) forming a pocket is said at least one layer of absorbent material;

c) taking a sound emitting device and embedding said device in said pocket formed within said at least one absorbent layer, such that the sound emitting device may emit sound upon application of a finger force to either said nappy or to said sound emitting device.

15 12 A method according to claim 11 comprising the further step of enclosing said at least one absorptive layer in a waterproof plastics layer, to isolate said sound emitting device from physical contact from the skin of a wearer, but allowing actuation of said sound emitting device by applying pressure to a layer of said nappy in a region proximate the location of said sound emitting device.

20 13 A method according to claim 12 wherein the nappy is constructed from an inner absorbent layer and an outer plastics layer, wherein the pocket housing the sound emitting device is formed from the same or a different material from the layer to which said pocket is attached.
14 A method of construction of a nappy comprising the steps of:

a) taking an absorbent material and forming an inner absorbent layer of said nappy,

b) taking a sound emitting device and embedding said device in said absorbent layer,

c) taking a plastics material and covering said absorbent material and said sound emitting device with said plastics material to form an outer layer;

d) allowing means to activate said sound emitting device to be accessible from outside said plastics outer layer or said inner absorbent layer.

15 A method of construction of a nappy comprising the steps of:

a) taking an absorbent material and forming an inner absorbent layer,

b) taking a plastics material and covering said absorbent material with said plastics material to form an outer barrier layer;

c) taking a sound emitting device and attaching said device to said barrier layer,

d) allowing means to activate said sound emitting device to be accessible from outside said plastics outer layer.

16 A nappy according to any of the foregoing claims wherein, the sound emitting device comprises a micro chip programmed with a predetermined musical tune and a mini speaker for emitting said sound upon pressure applied to an outer or inner layer of said nappy.

17 A nappy according to any one of the foregoing claims wherein the nappy is disposable and is formed of two layers comprising an inner absorptive layer, and an
outer barrier layer which envelops said absorptive layer and which prevent liquid
contact with an outer garment of a wearer, wherein the sound emitting device is held
in a pocket on an inside surface of said outer layer.

18 A nappy according to claim 1 wherein the sound emitting device located in the
nappy near the hip area of a wearer when the nappy is fitted.

19 A nappy according to claim 1 wherein the sound emitting device located in the
nappy near the upper thigh of a wearer when the nappy is fitted.

20 A nappy according to claim 1 wherein the sound emitting device located in the
nappy near connecting tabs which retain the nappy in position.

21 A nappy according to claim 1 wherein the sound emitting device located in the
nappy near the navel area of a wearer when the nappy is fitted.

22 A nappy according to claim 1 wherein the sound emitting device located in the
nappy near the lower back area of a wearer when the nappy is fitted.

23 A nappy according to claim 22 wherein the sound emitting device allows for
single or multi play of a sound recording.

24 A nappy according to any of the foregoing claims wherein the nappy includes
indicia to guide a user to a location within said nappy of said sound emitting device.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. 7: A61F 13/15, G10K 9/00

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)

REFER TO THE ELECTRONIC DATABASE CONSULTED AS BELOW

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

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

DWPI + key words (nappy, sound, amuse, entertain etc)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>GB 2306734 A (KIMSEY) 7 May 1997 See entire document</td>
<td>1-24</td>
</tr>
<tr>
<td>X</td>
<td>US 5395358 A (LU) 7 March 1995 See entire document</td>
<td>1-24</td>
</tr>
<tr>
<td>A</td>
<td>JP 11-52840 A (MATSUDA K) 26 February 1999 See entire document</td>
<td>1-24</td>
</tr>
</tbody>
</table>

* Further documents are listed in the continuation of Box C

X 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
5 June 2002

Date of mailing of the international search report

Name and mailing address of the ISA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
E-mail address: pti@ipaustralia.gov.au
Facsimile No. (02) 6283 3929

Authorized officer
Mr. SWAYAM CHINTAMANI
Telephone No: (02) 6283 2202

Form PCT/ISA/210 (second sheet) (July 1998)
### INTERNATIONAL SEARCH REPORT

**C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
</table>
This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GB 2306734</td>
<td>NONE</td>
</tr>
<tr>
<td>US 5395358</td>
<td>NONE</td>
</tr>
<tr>
<td>JP 11052840</td>
<td>NONE</td>
</tr>
<tr>
<td>US 5123467</td>
<td>NONE</td>
</tr>
</tbody>
</table>

END OF ANNEX