(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 753 616 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
23.12.2020 Bulletin 2020/52

(21) Application number: **18890480.9**

(22) Date of filing: **19.12.2018**

(51) Int Cl.:
A63H 3/36 *(2006.01)*

(86) International application number:
PCT/ES2018/070819

(87) International publication number:
WO 2019/122485 (27.06.2019 Gazette 2019/26)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **19.12.2017 ES 201731429**

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(54) **PERSONALISED DOLL WITH FEATURES MATCHING AN IMAGE OF A REAL MODEL AND PROCESS FOR MANUFACTURING SAME**

(57) Personalized doll with features adjusted to the image of a real model and its manufacturing process that includes (i) the capture of a profile image and another face image of the person or model; (ii) the adjustment of the factions of a digital three-dimensional base model of a doll's face to the profile and front images by means of a computer program adapted to such use; (iii) and the subsequent production of the doll's face based on the three-dimensional model adjusted by three-dimensional printing. The manufacturing process of the doll ends with the decoration and implantation of the remaining elements through the traditional process (artisanal). An executable computer program adapted to adjust the features of a digital three-dimensional base model of a wrist face and produce a file or instructions to allow three-dimensional printing using the digital three-dimensional model is also claimed.

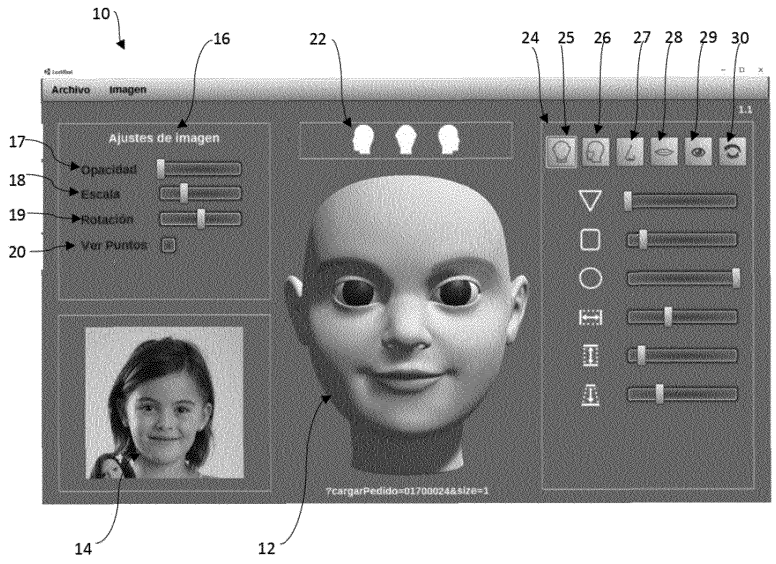

Fig. 1

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention belongs to the technical field of toys and gifts. In particular, but without being limited to this area, the present invention provides a process for the manufacture of personalized dolls, in particular dolls that mimic babies, small children or adults. However, this invention can also be applied to fiction dolls, mascots or famous people.

BACKGROUND OF THE INVENTION

[0002] The wrist sector is a very traditional sector, in which manufacturing processes have remained unchanged for many years.

[0003] The traditional process of making a doll could be summarized in the following steps:
Creation of a wax model of the face of the doll, made by an artist that follows the manufacturer's guidelines.

[0004] Manufacture of a mold, from the model in wax, which can be made by various techniques. The most common technique in the wrist sector is electroplating. Electroplating consists of coating the model in wax with metallic layers. The manufacture of the mold includes the insertion of hooks for a correct assembly of the wrist.

[0005] Production of wrist components by rotomolding. Mainly the material used in the manufacture of dolls is plasticized PVC or plastisol and the transformation technique is rotational molding.

[0006] Finishes. The finishes that are made to the wrist, once obtained the plastisol parts, are the decoration of mouths, eyebrows, the implantation of eyes, eyelashes and hair, assembly, etc. The finishing can be diverse, according to the requirements of the client.

[0007] Packaging. Finally, the decorated dolls are dressed and packaged to be shipped to their destination.

[0008] The main limitation of the traditional process of making dolls is the creation of models. This creation of models is an expensive process and this forces manufacturers to have to produce a large amount of product to be able to amortize the cost of creating models and molds. This fact is reflected in the fact that there is a large number of children who have dolls or dolls with the same appearance, so dolls or dolls convey a sense of artificiality that is not well received by children, because it causes them to stop play with dolls or dolls that seem more artificial and instead prefer to play with dolls that convey the feeling of being more natural or with which children can feel more familiar.

[0009] That is why, in this sector there have been many achievements in reproducing dolls with effects imitating real characteristics of babies or children, such as imitating blinking, eyes, hair, crying, babbling, breastfeeding, urination, defecation, movements, texture, etc. of babies or children.

Summary of the invention

[0010] A first aspect of the present invention provides a process for making dolls or doll faces comprising:

- the capture of a frontal image and a profile image of a person or model's face;
- the generation of a digital three-dimensional model of a wrist face based on an adjustment of the features of a three-dimensional digital model based on the features of the frontal image and the profile image of the person or model's face; Y
- manufacture of the doll's face by means of additive manufacturing of plastic material based on the adjusted digital three-dimensional model of the doll's face.

[0011] The application of new additive manufacturing technologies, such as three-dimensional printing, eliminates the most expensive processes of traditional doll manufacturing. Through the use of additive manufacturing, it is not necessary to manufacture models and molds to obtain the faces. This advantage makes it possible to create a much larger number of different models, without incurring excessive cost. It even allows custom dolls to be created by order without incurring an excessive final cost.

[0012] This feature allows children to feel that they have a unique product, different from other children, which means that children will use these dolls more regularly and show greater acceptance of them. From the commercial point of view, the greater the offer of different models of dolls, the greater will be the sales capacity of puppets of a certain company, since a greater number of children can be attracted to the purchase of these dolls. ace.

[0013] The capture of a profile image and another in front of a person's face, preferably a child or a baby, is possible to transfer to the wrist / or the captured features, by generating a digital three-dimensional model of a wrist face that It is used as a base for the additive manufacture of plastic material of the face of the wrist. It is not essential that the images are of a person, this process could also be applied to other types of models, such as pets, fictional characters, famous people, etc.

[0014] Through this process, dolls are produced with which the children can feel identified and / or familiar. This is the case, for example, when taking the facial features of the child himself / herself. This produces a doll with which the child can feel familiar, for having features such as mouth, eyes and / or nose that are close or familiar and feel identified with their dolls. This has an impact on children showing greater acceptance and appreciation of them.

[0015] Preferably, the capture of the front image and the profile image comprises the making of digital photo-

graphs of the person. Digital photography is a very advantageous method because it creates digital images that can be sent easily through the internet and can be used by a computer program adapted to generate digital three-dimensional models of doll faces.

[0016] Optionally, the capture of the front and profile images can be obtained by scanning a printed photograph. Other alternatives for the capture of images can be the realization of portraits, sketches or cartoons.

[0017] Preferably the generation of the digital three-dimensional model of the doll's face is carried out with a computer program adapted to generate three-dimensional digital models of doll faces. This brings advantages because the digital three-dimensional model of the wrist face is made faster by using a computer program adapted for that purpose.

[0018] Preferably, the generation of the digital three-dimensional model of the wrist face by means of an adapted computer program comprises the contribution of a digital three-dimensional base model. The contribution of a digital base model implies that the steps to create the elements common to all three-dimensional digital models of doll faces do not need to be repeated each time you want to produce a wrist face.

[0019] Preferably, the generation of a digital three-dimensional model of a wrist face based on an adjustment of the features of said digital three-dimensional model based on the features of the front image and the profile image of the person's face comprise the comparison or superimposing on a computer screen the front and profile images with a representation of the front three-dimensional digital model and profile, respectively. When making the comparison on a computer screen it is easier to appreciate the similarity and differences between the images of the person's face and the representation of the digital three-dimensional base model.

[0020] Preferably, the adjustment of the features of said digital three-dimensional model to the features of the front image and the profile image of the person's face comprises the adjustment of each of the features separately. This feature allows fractioning the adjustment of the digital three-dimensional base model in several stages, to simplify the process and make it more intuitive and enjoyable for the user. This feature allows to obtain a final appearance of the face of the wrist / or more adjusted to the wishes of the client.

[0021] Preferably, the adjustment of the factions of the digital three-dimensional base model comprises the adjustment of one or several properties of each faction by sliding dials in the interface of the computer program. For example, the shape, width, height and other characteristics of eyes, mouth, nose, eyebrows, etc. can be adjusted separately. This allows a great flexibility and interactivity and adaptability of the process of generation of the final digital three-dimensional model to produce personalized puppets with features very similar to those of the child to whom the doll is to be given, with the consequent acceptance and satisfaction for its part.

[0022] Preferably, the process comprises the generation of a computer file containing the finished digital three-dimensional model compatible with the computer system of an additive plastic manufacturing machine. This allows the rapid transmission of the digital three-dimensional model to the step of additive manufacturing.

[0023] After obtaining the face of the wrist / or by additive manufacture of plastic material, the process can optionally include: the painting of the face, the setting and implantation of eyes and eyelashes, the stitching of the hair on an upper cap of the wrist or the assembly of the upper cap and face on a doll body.

[0024] A second aspect of the invention provides a wrist face / or obtained by: - capturing a front image and a profile picture of a person or model's face;

- the generation of a digital three-dimensional model of the doll's face based on an adjustment of the factions of a three-dimensional digital model based on the features of the frontal image and the profile image of the person or model's face; Y
- manufacture of the wrist face by additive manufacturing of plastic material based on the adjusted digital three-dimensional model of the doll's face.

[0025] A wrist face obtained by additive manufacture of plastic material is able to reproduce at a cost that is not prohibitive or affordable by most of the public and with a great level of detail the features obtained by capturing the image of a person's face or model. This implies the possibility of manufacturing individualized and personalized dolls with familiar facial features for the client or child to whom the doll is intended to be presented.

[0026] Preferably, the additive manufacturing of plastic material comprises three-dimensional printing. This additive manufacturing technique has reached levels of development that allow additive manufacturing at very acceptable costs and times and with a high level of detail that makes the final product affordable and widely accepted by the public.

[0027] Preferably the plastic material comprises polyamide 12. This plastic material is the only one that is processed by the three-dimensional printers available today. However, the nature of the invention is such that other plastic materials may be employed, as they become available for use in additive manufacturing methods.

[0028] Preferably the capture of the face image of the real person or model is obtained by electronic photography.

[0029] A third aspect of the invention provides a wrist / or comprising a face as described in the first or second aspect of the invention.

[0030] A fourth aspect of the invention provides a computer system adapted to receive a capture of the face image of a real person or model, generate a digital three-dimensional model based on the facial features of the person or real model and produce a file or instructions

Suitable for making the additive manufacture in plastic material of a doll face based on the features of the real person or model.

[0031] A fifth aspect of the invention provides a computer support containing an executable file configured to receive a capture of the face image of a real person or model, generate a digital three-dimensional model based on the face features of the person or real model and produce an appropriate file or instructions to perform the additive manufacturing in plastic material of a doll's face based on the features of the real person or model.

[0032] One or more features of any aspect of the invention are transferable to and combinable with the characteristics of any other aspect of the invention without detriment to the scope of protection of the invention. In particular, this description is not considered limiting in terms of materials used, dimensions or order of the elements or characteristics of the process and / or products described.

[0033] The following drawings show an embodiment of the invention, by way of example only, without intending, in any case, to constitute a limitation thereof.

Figure 1. Figure 1 shows the interface or screen of a computer program or software executed by a personal computer to process the capture of the features and obtain the digital three-dimensional model of a wrist face.

Figure 2. Figure 2 shows a wrist face obtained by three-dimensional printing of a digital three-dimensional model obtained by a computer program and based on the captured features of a real person.

Figure 3. Figure 3 shows the wrist face of Figure 2 after being painted.

Figure 4. Figure 4 shows the wrist face of Figure 3 after being decorated (makeup) and having inserted eyes and eyelashes.

Figure 5. Figure 5 shows the wrist face of Figure 4 after having fitted an upper cap with stitched hair and the rest of the body of the wrist.

Detailed description of the invention

[0034] Figure 1 shows the interface 10 of the computer program adapted to generate a digital three-dimensional model 12 of the face of a doll. In this interface 10, the front representation of the digital three-dimensional model 12 is observed in the central area of the interface. In the lower left corner we can see the capture of the front 14 image of a person's face, in this case a girl.

[0035] In the upper left corner, options 16 are observed to adapt the capture of the face image to the dimensions and position of the digital three-dimensional base model. These options are opacity 17, to show or hide the face image superimposed with the digital three-dimensional model; scale 18, to change the size of the image; rotation 19, to rotate the image; and see points 20, to show an indicator of the position of eyes, nose and mouth.

[0036] In the upper central part, the icons 22 are shown corresponding to the options of displaying the face image and the digital three-dimensional front or profile model.

[0037] On the right side are the icons 24 corresponding to each one of the features of the digital three-dimensional model that can be adjusted separately, and in the lower part the sliding dials to adjust the different characteristics of the features of the digital three-dimensional model.

[0038] In this case, the factions that can be adjusted are, from left to right, in correspondence with each of the icons shown, the following: perimeter of face 25, jaw 26, nose 27, mouth 28, eyes 29, eyebrows and eyelashes 30. The characteristics of each faction that can be adjusted are height, width, shape and depth, among others.

[0039] Figures 2, 3, 4 and 5 show different manufacturing states of a wrist according to the present invention.

[0040] Figure 2 shows the face of the wrist after being printed on polyamide 12 in a digital printer of the Jet Fusion type of the manufacturer HP. In the future it is foreseeable that other different plastic materials can be used.

[0041] Figure 3 shows the face of the doll painted in "flesh" color, in imitation of the skin color of the girl in the image. The painting is done in the cabin using a spray gun.

[0042] Figure 4 shows the face of the doll after having been decorated and having inserted the eyes of 12 mm in diameter by gluing with a silicone gun.

[0043] Figure 5 shows the doll after having mounted the face with the helmet with sewn hair and with the body of the doll. The body, limbs and helmet are made of plasticized PVC in a rotomolding furnace. The hair has been sewn by machine to the plasticized PVC helmet. The adhesive used for the assembly is high viscosity cyanoacrylate.

Claims

1. Process of making dolls or doll faces that includes:

   - the capture of a frontal image and a profile image of a person or model's face;
   - the generation of a digital three-dimensional model of a wrist face based on an adjustment of the features of a three-dimensional digital model based on the features of the frontal image and the profile image of the person's face; and
   - manufacture of the face of the wrist through additive manufacturing of plastic material based on the digitally adjusted three-dimensional model of the doll's face.

2. Process according to claim 1, wherein the capture of the front image and the profile image comprises

the making of digital photographs of the person.

3. Process according to claim 1, wherein the capture of the front and profile images comprises the scanning of a printed photograph.

4. Process according to claim 1 wherein the capture of the front and profile images comprises the realization of portraits, sketches or cartoons.

5. Process according to any previous claim in which the generation of the digital three-dimensional model of the wrist face is performed with a computer program adapted to generate digital three-dimensional models of doll faces.

6. Process according to claim 5 comprising the contribution of a three-dimensional digital base model.

7. Process according to claim 6 comprising the comparison or superimposition in a computer screen of the front and profile images with a representation of the front and profile digital three-dimensional base model, respectively.

8. Process according to any preceding claim wherein the adjustment of the factions of the base digital three-dimensional model to the features of the front image and the profile image of the person's face comprises the adjustment of each of the features separately.

9. Process according to claim 8 when it depends on any of claims 5 to 7 in which the adjustment of the factions of the digital three-dimensional base model comprises the adjustment of one or more properties of each faction by sliding dials in the interface of the computer program.

10. Process according to any preceding claim comprising the generation of a computer file containing the finished digital three-dimensional model compatible with the computer system of an additive plastic manufacturing machine.

11. Process according to any previous claim wherein the manufacture of the face of the wrist by additive manufacturing of plastic material based on the digitally adjusted three-dimensional model of the wrist face comprises three-dimensional printing.

12. Process according to any preceding claim comprising the painting of the face, the decoration and implantation of eyes and eyelashes, the sewing of the hair on an upper cap of the wrist or the assembly of the upper cap and the face on a doll body.

13. A doll face / or obtained by:

- the capture of a frontal image and a profile image of a person or model's face;
- the generation of a digital three-dimensional model of the wrist face based on an adjustment of the features of a three-dimensional digital model based on the features of the frontal image and the profile image of the person's face; and
- manufacture of the wrist face by additive manufacturing of plastic material based on the adjusted digital three-dimensional model of the doll's face.

14. A wrist face according to claim 13, wherein the additive manufacturing of plastic material comprises three-dimensional printing.

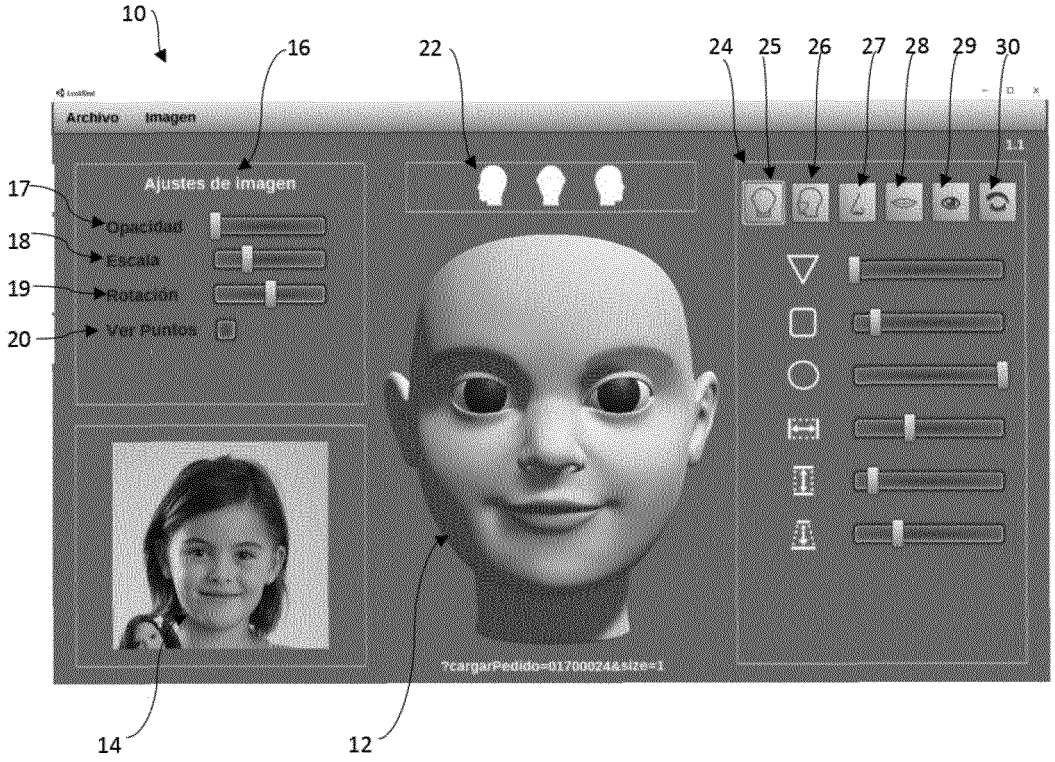
15. A wrist face according to claim 13 or 14 wherein the plastic material comprises polyamide 12.

16. A wrist face according to any of claims 13 to 15 in which the capture of the image of the face of the person or model is obtained by electronic photography.

17. Wrist comprising a face produced according to the process of claims 1 to 12 or a face according to claims 13 to 16.

18. Computer system adapted to receive a capture of the image of the face of a person or real model, generate a digital three-dimensional model based on the features of the face of the person or real model and produce a file or instructions suitable for making additive material manufacture plastic of a doll face based on the features of the real person or model.

19. Computer support containing an executable file configured to receive a capture of the face image of a real person or model, generate a digital three-dimensional model based on the features of the face of the real person or model and produce a file or appropriate instructions to perform the additive manufacture in plastic material of a doll face based on the features of the real person or model.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12

Fig. 1

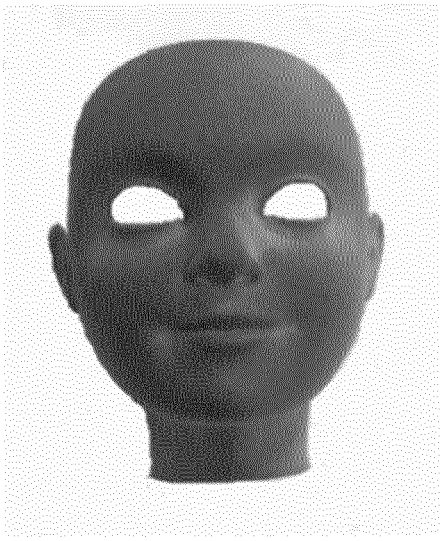

Fig. 2

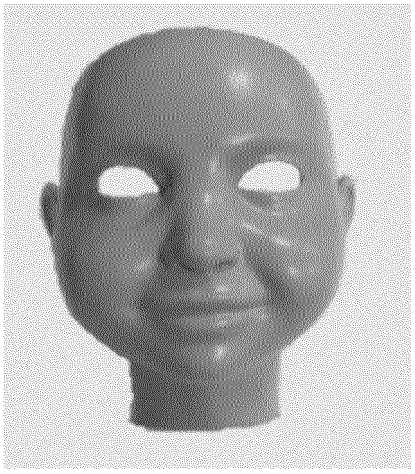

Fig. 3

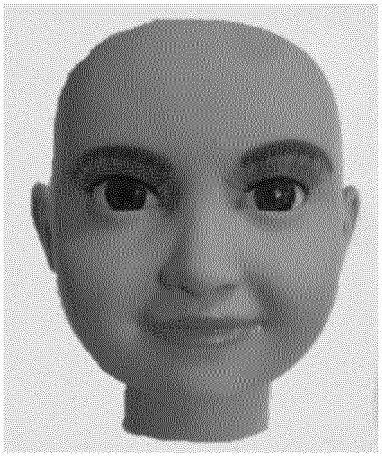

Fig. 4

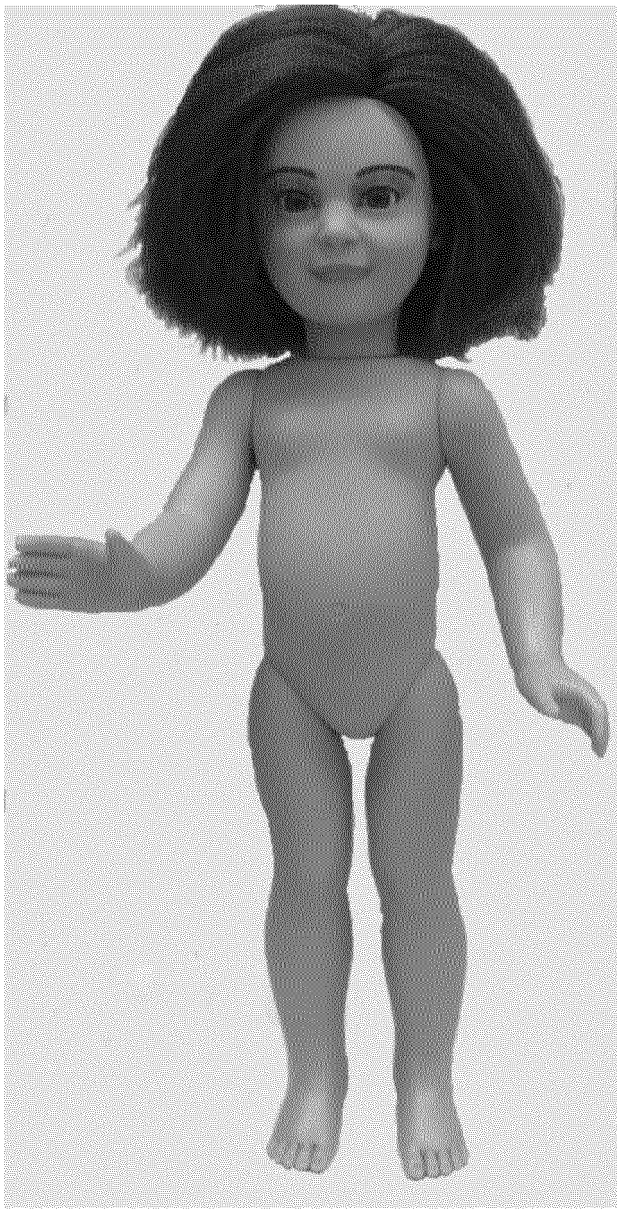

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2018/070819

A. CLASSIFICATION OF SUBJECT MATTER

A63H3/36 (2006.01)

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)
A63H

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)

EPODOC, INVENES ,WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MUÑECA_LOOKREAL. 09/10/2017, Retrieved from internet URL: https://www.youtube.com/watch?v=YRikd9b0yKA	1-19
X	INTERFACE_MUÑECA. 20/10/2017, Retrieved from internet URL: https://www.youtube.com/watch?v=ZzFCoznzOzE	1-19
A	US 2016073719 A1 (BARAD JILL E) 17/03/2016, Abstract from DataBase WPI. Retrieved from EPOQUE; figures 1 – 2,	1-19
A	US 6549819 B1 (DANDURAN LARRY DALE ET AL.) 15/04/2003, Abstract from DataBase WPI. Retrieved from EPOQUE; figure 1,	1-19
A	US 4929213 A (MORGAN RICHARD H) 29/05/1990, Abstract from DataBase WPI. Retrieved from EPOQUE; figures 1 – 5,	1-19
A	US 2015231516 A1 (LAUER DANIEL J) 20/08/2015, Abstract from DataBase WPI. Retrieved from EPOQUE; figure 25A-C.	1-19

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

* Special categories of cited documents:
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08/04/2019	**(09/04/2019)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer M. López de Rego Lage Telephone No. 91 3498405

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2018/070819

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US2016073719 A1	17.03.2016	NONE	
US6549819 B1	15.04.2003	NONE	
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US2015231516 A1	20.08.2015	US2017203220 A1 WO2015123118 A1 US9504925 B2	20.07.2017 20.08.2015 29.11.2016

Form PCT/ISA/210 (patent family annex) (January 2015)