scanning method do not adequately take into account the overall biomechanics of the foot and the ankle.

There is, therefore, a need for a solution that improves the overall process of obtaining foot analysis data to be used upon manufacturing of, for example, insoles, custom footwear like shoes and sandals, and various orthotic supports.

Summary

Now there has been invented an improved method and technical equipment implementing the method, by which the above problems are alleviated. Various aspects of the invention include a method, and an apparatus which are characterized by what is stated in the independent claims. Various embodiments of the invention are disclosed in the dependent claims.

According to a first aspect, there is provided a method for obtaining foot analysis data for a manufacture of an insole, footwear, an orthopedic support, or at least one pressure sock, the method comprising: subjecting at least one foot of a person to a three-dimensional (3D) scanning apparatus; performing a first 3D scanning of a shape of the foot, wherein the person is standing in a straight position; performing a second 3D scanning of the shape of said foot, wherein the person provides excess pressure on the foot by squatting; and performing a third 3D scanning of the shape of said foot, wherein toes of the foot are lifted up; providing captured 3D image/video data to a computing device for forming a point cloud describing a shape and dimensions of the foot; detecting, based on said at least three 3D scans, whether the foot is subjected to excessive pronation or excessive supination while under pressure; and determining, based the point cloud describing the shape and dimensions of the foot, manufacturing information for forming an insole or for manufacturing footwear, an orthopedic support or at least one pressure sock.

According to an embodiment, said second 3D scanning of the shape of said foot is performed, when the person is squatting with a heel in contact with a plane for standing of said 3D scanning apparatus such that a knee angle between a thigh and a leg is substantially between 80 - 150 degrees.

According to an embodiment, the 3D scanning apparatus comprises a plurality of cameras arranged to perform the 3D scanning from an oblique upright direction.

According to an embodiment, the method further comprises performing, by at least one of the cameras, the 3D scanning at least partly from behind the foot.

According to an embodiment, the method further comprises providing, by the cameras of the 3D scanning apparatus, captured 3D image/video data to a computing device for forming a point cloud describing a shape and dimensions of the foot.

According to an embodiment, the method further comprises detecting, based on said at least three 3D scans, whether the foot is subjected to excessive pronation or excessive supination while under pressure.

According to an embodiment, the method further comprises determining, based on foot information on the shape and dimensions of the foot, manufacturing information for forming an insole from an insole preform or for manufacturing footwear, an orthopedic support or at least one pressure sock.

According to a second aspect, there is provided an apparatus for obtaining foot analysis data for a manufacture of an insole, footwear, an orthopedic support, or at least one pressure sock, said apparatus comprising: means for subjecting at least one foot of a person to a three-dimensional (3D) scanning apparatus wherein said 3D scanning apparatus is configured to perform: a first 3D scanning of a shape of the foot, wherein the person is standing in a straight position; a second 3D scanning of the shape of said foot, wherein the person provides excess pressure on the foot by squatting; and a third 3D scanning of the shape of said foot, wherein toes of the foot are lifted up; wherein said 3D scanning apparatus is configured to provide captured 3D image/video data to a computing device configured to form a point cloud describing a shape and dimensions of the foot; means for detecting, based on said at least three 3D scans, whether the foot is subjected to excessive pronation or excessive supination while under pressure; and means for determining, based on the point cloud describing the shape and dimensions of the foot, manufacturing information for forming an insole

or for manufacturing footwear, an orthopedic support or at least one pressure sock.

As disclosed, there is provided a system comprising a processor, memory including computer program code, the memory and the computer program code configured to, with the processor, cause the system to perform steps of the above method or any of the related embodiments.

Claims:

1. A method for obtaining foot analysis data for a manufacture of an insole, footwear, an orthopedic support, or at least one pressure sock, the method comprising:

subjecting at least one foot of a person to a three-dimensional (3D) scanning apparatus;

performing a first 3D scanning of a shape of the foot, wherein the person is standing in a straight position;

performing a second 3D scanning of the shape of said foot, wherein the person provides excess pressure on the foot by squatting; and

performing a third 3D scanning of the shape of said foot, wherein toes of the foot are lifted up;

providing captured 3D image/video data to a computing device for forming a point cloud describing a shape and dimensions of the foot;

detecting, based on said at least three 3D scans, whether the foot is subjected to excessive pronation or excessive supination while under pressure; and

determining, based on the point cloud describing the shape and dimensions of the foot, manufacturing information for forming an insole or for manufacturing footwear, an orthopedic support or at least one pressure sock.

2. The method according to claim 1, wherein said second 3D scanning of the shape of said foot is performed, when the person is squatting with a heel in contact with a plane for standing of said 3D scanning apparatus such that a knee angle between a thigh and a leg is substantially between 80 - 150 degrees.

3. The method according to claim 1 or 2, wherein the 3D scanning apparatus comprises a plurality of cameras arranged to perform the 3D scanning from an oblique upright direction.

4. The method according to claim 3, wherein at least one of the cameras is arranged to perform the 3D scanning at least partly from behind the foot.

5. An apparatus for obtaining foot analysis data for a manufacture of an insole, footwear, an orthopedic support, or at least one pressure sock, said apparatus comprising:

means for subjecting at least one foot of a person to a three-dimensional (3D) scanning apparatus; wherein said 3D scanning apparatus is configured to perform:

- a first 3D scanning of a shape of the foot, wherein the person is standing in a straight position;
- a second 3D scanning of the shape of said foot, wherein the person provides excess pressure on the foot by squatting; and
- a third 3D scanning of the shape of said foot, wherein toes of the foot are lifted up;

wherein said 3D scanning apparatus is configured to provide captured 3D image/video data to a computing device configured to form a point cloud describing a shape and dimensions of the foot;

means for detecting, based on said at least three 3D scans, whether the foot is subjected to excessive pronation or excessive supination while under pressure; and

means for determining, based on the point cloud describing the shape and dimensions of the foot, manufacturing information for forming an insole or for manufacturing footwear, an orthopedic support or at least one pressure sock.

6. The apparatus according to claim 5, wherein

said second 3D scanning of the shape of said foot is configured to be performed when the person is squatting with a heel in contact with a plane for standing of said 3D scanning apparatus such that a knee angle between a thigh and a leg is substantially between 80 - 150 degrees.

7. The apparatus according to claim 5 or 6, wherein the 3D scanning apparatus comprises a plurality of cameras configured to perform the 3D scanning from an oblique upright direction.

8. The apparatus according to claim 7, wherein at least one of the cameras is configured to perform the 3D scanning at least partly from behind the foot.