(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 September 2020 (10.09.2020)

WIPO | PCT

(10) International Publication Number
WO 2020/181301 A1

(51) International Patent Classification:
G07D 11/00 (2019.01) *G07D 11/30* (2019.01)
G07D 7/00 (2016.01) *G07D 11/32* (2019.01)
G07D 11/24 (2019.01)

(21) International Application Number:
PCT/ZA2020/050002

(22) International Filing Date:
08 January 2020 (08.01.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2019/01358 05 March 2019 (05.03.2019) ZA

(72) Inventors; and

(71) Applicants: **MARCUS, Dean Shane** [VC/ZA]; 65 Serenade Road, Elandsfontein, 1400 Germiston (ZA). **MARCUS, Stanley** [VC/ZA]; 65 Serenade Road, Elandsfontein, 1400 Germiston (ZA).

(74) Agent: **MCCALLUM RADEMEYER & FREIMOND** et al.; 390 Kent Avenue, Ferndale, (P.O. Box 1130, Randburg), 2125 Johannesburg (ZA).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*

(54) Title: A SYSTEM FOR PROCESSING BANK NOTES

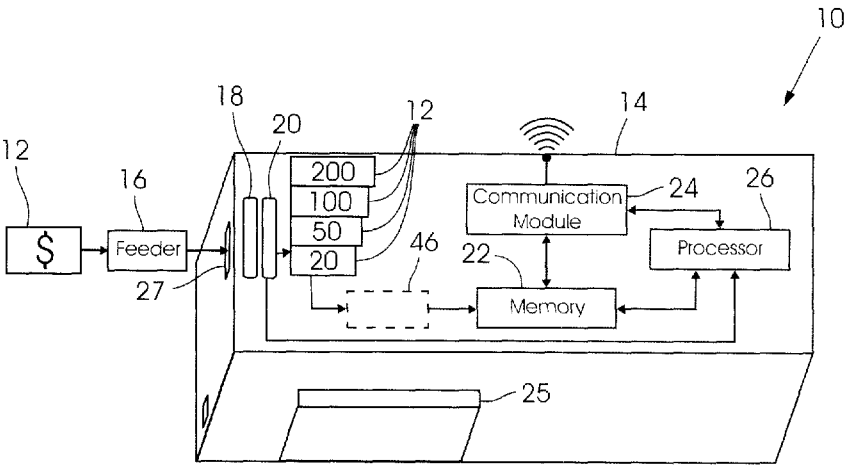

FIGURE 1

(57) Abstract: A system and an apparatus for processing bank notes and rendering genuine bank notes non-usable.

WO 2020/181301 A1

A SYSTEM FOR PROCESSING BANK NOTES

BACKGROUND OF THE INVENTION

[0001] This invention relates to a system for processing bank notes.

[0002] Typically, in a cash transaction, a customer pays a cashier in cash for goods purchased or services rendered. The cash is counted, and then stored in a till drawer. Cash accumulates in the till drawer until the cashier removes the cash, usually for transfer to a place of safekeeping.

[0003] At appropriate time intervals, the cash, and in particular bank notes, is ready to be transferred to a bank. The cash is placed in a container for collection by a transport service, such as an armoured car company, for conveyance to a central sorting location or to a bank.

[0004] Once the container arrives at its destination the contents thereof are verified against a deposit slip before the value of the cash is credited to the bank account of the client concerned.

[0005] Unfortunately, a store's exposure to violent armed robbery is linked to the amount of readily accessible cash held in the store. Additionally, the risk of robbery while the cash is being transported from the store to a central sorting location or bank is significant, for cash in transit heists are commonplace.

[0006] EP2414243 discloses an apparatus for forming stacks of sheet documents, i.e. bank notes, and a corresponding method thereof which relates to the sorting of bank notes into different denominations or currencies. The CPS 1200, also known as the De La Rue 7000, is a document handling apparatus intended to facilitate the processing of bank notes, which counts,

verifies, sorts, and bundles banknotes which are suitable or fit for use. Unfit bank notes are destroyed.

[0007] It is an aim of the current invention to provide a system to address, at least to some extent, the aforementioned robbery situation.

SUMMARY OF THE INVENTION

[0008] The invention provides a system for processing bank notes which includes the following:

a) a housing for receiving bank notes;

b) a data capture device for capturing data related to the received bank notes;

c) a communications module for transmitting the captured data to a database, and

d) a component for rendering the bank notes, received at the housing, non-usable.

[0009] "Non-usable" in this context means that the bank notes no longer constitute legal tender.

[0010] The bank notes may be rendered non-usable using any suitable technique e.g. the notes may be damaged, shredded, torn, perforated or marked with an indelible dye. The manner in which the bank notes are rendered non-usable is not limited in this respect.

[0011] The housing may include a receptacle for receiving the bank notes. A slot or opening may be formed in the housing through which the bank notes can be placed into the housing. Thereafter the bank notes are transferred to the receptacle.

[0012] The data capture device may include a scanner which is located at or near the slot, thereby to scan the bank notes and capture relevant information relating to each bank note.

Such information may include at least the serial number of the bank note and its denomination. An image may be kept of each bank note.

[0013] The bank notes are preferably subjected to a validation process to ascertain whether the bank notes are genuine i.e. legal currency. False or counterfeit bank notes are eliminated, put to one side, and are not further processed in the system, i.e. they are not rendered non-usable.

[0014] The system may include a processor, in communication with the data capture device, to receive and process the data relating to each bank note and to transfer the data to the communication module. The processor may calculate a sum (the total) of the denominations of all of the genuine bank notes i.e. generate a record of the value of all of the genuine bank notes received.

[0015] The system may include a memory unit, linked to the processor, in which data is stored.

[0016] The database may be under the control of, or be located at, an institution which may be remote from the housing. The institution may be a financial institution e.g. a bank with which a retailer, wholesaler or other entity, which is a party to the system, has an account.

[0017] The data which is transferred to the database may be accompanied by a unique identifier which identifies the origin of the transaction i.e. the owner of, or an operator at the housing. At the institution the account which is owned by such entity can then be credited with the value of the genuine bank notes received and the transaction is then processed fully.

[0018] An input device, e.g. a keyboard, and an output device e.g. a display, may be included in the system to allow an operator to exercise control over aspects of the operation and to monitor operation of such system.

[0019] The invention also provides an apparatus for processing bank notes which includes a housing, a deposit mechanism for inputting bank notes manually or automatically into the housing, a validation device which examines each bank note to determine whether the bank note is genuine and which enables genuine bank notes to be separated from non-genuine bank notes, a scanner which, in respect of each genuine bank note, captures data relating to a serial number and to a denomination of the bank note, a memory module in which such captured data is stored, a communication module for transferring the captured data to a designated location, and a component for then rendering each genuine bank note non-usable.

[0020] The scanner may generate an image of each bank note, and the image may be stored in the memory module.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The invention is further described by way of example with reference to the accompanying drawings wherein:

Figure 1 depicts an apparatus according to the invention; and

Figure 2 shows in block diagram form a system according to the invention which is based on the use of the apparatus shown in Figure 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0022] Figure 1 shows an apparatus 10 according to the invention for processing a bank note 12 which is one of a plurality of bank notes processed in succession by the apparatus 10.

[0023] The apparatus 10 includes a housing 14, a mechanism 16 for inputting bank notes into the housing 14, a validation device 18 which examines each bank note, a scanner 20 which captures data relating to each of the bank notes 12, a memory module 22 in which such captured data is stored, a communication module 24 for transferring the captured data to a database at a designated location, and a component 25 for rendering genuine bank notes non-usable. These devices function under the control of a processor 26.

[0024] The mechanism 16 is conventional and typically includes a roller driven bank note feeder which causes the bank notes to pass through a slot 27 into the housing 14 for further processing.

[0025] Figure 2 schematically depicts a system 28 which is based on the use of the apparatus 10 and which is used for processing bank notes 12. In the system 28, the mechanism 16 is used to receive bank notes 12 manually or automatically, and then to transfer the notes into the housing 14. The system 28 is installed in a protected safe location at the premises of an entity which receives the bank notes 12 in respect of transactions to which the entity is a party, e.g. the sale of goods or rendering of services.

[0026] The validation device 18 examines each bank note to determine whether the bank note is genuine and enables genuine bank notes 30 to be separated from non-genuine bank notes 32. This type of device is known in the art.

[0027] The scanner 20 captures data 34 relating to a serial number and to a denomination of each genuine bank note 30. Optionally a full image of at least one side of each genuine bank note 30 is also captured and recorded. All the data pertaining to the genuine bank notes is stored in the memory module 22. If desired similar data pertaining to the non-genuine bank notes 32 can also be captured and logged, if necessary by using another scanner (not shown).

[0028] The communication module 24 transmits the captured data 34, taken from the module 22, to a database 40 of a financial institution 42, such as a bank, at which an entity, which makes use of the system 28, has an account. A communication link between the module 24 and the database 40 could be physical e.g. via conductors or via a fibre optic cable, or wireless techniques could be employed. A unique identifier is simultaneously generated and transferred to the institution to identify the origin of the data and all details pertaining to the transaction.

[0029] The system 28 includes an input device 36 to exercise control over aspects of the operation of the system and an output device 38 which allows an operator to monitor or view operation of such system. Preferably, the input device 36 is a keyboard and the output device 38 is a display, this is exemplary only and the devices can take any suitable form.

[0030] Once the data 34 has been transferred to and captured in the database 40, the genuine bank notes 30 are transferred into a receptacle 46 (shown in dotted outline in the housing). The notes in the receptacle are thereafter rendered non-usable by operation of the component 26. The notes 30 could be shredded, torn, perforated or marked with an indelible dye by the component 25. In this embodiment, which is non-limiting, the component 25 is a shredder and the bank notes 30 are shredded to produce waste 47 which is discarded, as required.

[0031] The financial component of the data 34, i.e. the sum of the money values of the shredded genuine bank notes, is stored in the database 40 of the financial institution 42 and is credited to the entity's account (step 48).

[0032] Recording of the transactions can occur in real time as the bank notes 12 are scanned and as the captured data is transferred to the module 22 and then, from the module 22 to the institution. This is a preferred mode of operation. Alternatively, the data could be transferred in batches at predetermined time intervals to the institution.

[0033] The non-genuine notes 32 are not destroyed but are kept for treatment according to a protocol 50, the nature of which is not important to an understanding of the present invention. As stated a record of relevant details of the non-genuine bank notes 32 can be generated by the scanner 20, or by means of a second scanner, not shown.

[0034] The invention enables cash transactions to be processed at a financial institution as they occur, i.e. in real time, thereby creating the possibility to have the genuine bank notes destroyed or marked immediately, or soon after each transaction is completed. Thus, usable bank notes are not kept on the entity's premises, e.g. a store or service centre. The need to transport bank notes physically from a store (for example) to a bank or to a similar financial institution is eliminated. This feature will help to deter robbery and heist attempts in store and during transport of the bank notes, from a store to a bank or other institution.

[0035] An entity which makes use of the system 28 would be required to keep a float, i.e. a small amount of readily available cash, to operate the business and effect cash transactions in a normal manner e.g. to furnish change as may be necessary for cash transactions.

[0036] Instead of processing bank notes on a continuous basis, i.e. as the bank notes are received, it is possible to accumulate the notes and then to process the notes on a batch basis. It is also possible to link a conventional cash register directly to the system 28 so that once a banknote is received it is validated, scanned, and its data is captured. The validated note is then automatically destroyed.

[0037] The benefit of the invention provided to an entity that handles in-coming cash is significant in that the opportunity to access usable banknotes is eliminated once the banknotes are effectively destroyed. The likelihood of a cash robbery or a heist occurring is significantly reduced. Although the destroyed genuine bank notes have an intrinsic value viz cost of manufacture thereof, such value would normally be exceeded by the cost of handling the genuine bank notes in a conventional way – such cost includes transport, security and insurances and, moreover, is accompanied by a heightened risk of attack or robbery in which personnel are exposed to violence, possible injury and death.

CLAIMS

1. A system (28) for processing bank notes (12) which includes the following:
   a) a housing (14) for receiving bank notes (12);
   b) a data capture device (18) for capturing data related to the received bank notes (12);
   c) a communications module (24) for transmitting the captured data (34) to a database (40); and
   d) a component (25) for rendering the bank notes (30), received at the housing (14), non-usable.
2. A system (28) according to claim 1 wherein the bank notes (30) are rendered non-usable by the component (25) by damaging, shredding, tearing, perforating, or marking the bank notes with an indelible dye.
3. A system (28) according to claim 1 wherein the housing (14) includes a receptacle (46) for receiving the bank notes (12).
4. A system (28) according to claim 3 wherein a slot or opening (27) is formed in the housing (14) through which the bank notes (12) are placed into the receptacle (46).
5. A system (28) according to claim 1 wherein the data capture device (18) includes a scanner (20), thereby to scan the bank notes (12) and capture relevant information relating to the bank notes (12).
6. A system (28) according to claim 5 wherein the information includes at least a serial number and denomination of each bank note.
7. A system (28) according to claim 1 wherein the bank notes (12) are subjected to a validation process to ascertain genuineness.

8. A system (28) according to claim 7 wherein false or counterfeit bank notes (32) are eliminated and are not further processed in the system.

9. A system (28) according to claim 7 which includes a processor (26), in communication with the data capture device (18), to receive and process the data relating to the genuine bank notes (30) and to transfer the data to the communication module (24).

10. A system (28) according to claim 9 wherein the processor (26) calculates a sum of the denominations of all of the genuine bank notes (30) received.

11. A system (28) according to claim 1 which includes a memory unit (22), linked to the processor (26), in which the captured data (34) is stored.

12. A system (28) according to claim 9 wherein the database (40) is under the control of, or is located at an institution (42) with which an entity, which is a party to the system, has an account.

13. A system (28) according to claim 12 wherein the captured data (34) which is transferred to the database (40) is accompanied by a unique identifier which identifies the origin of the transaction.

14. A system (28) according to claim 10 wherein the calculated sum is credited to an account (48) of an entity which is a party to the system.

15. A system (28) according to claim 12 which includes an input device (36) to control operation of the system.

16. A system (28) according to claim 12 which includes an output device (38) which allows operation of the system to be monitored.

17. An apparatus (10) for processing a bank note (12) which includes a housing (14), a deposit mechanism (16) for inputting bank notes (12) manually or automatically into the housing (14), a validation device (18) which examines each bank note to determine

whether the bank note (12) is genuine and which enables genuine bank notes (30) to be separated from non-genuine bank notes (32), a scanner (20) which, in respect of each genuine bank note (30), captures data (34) relating at least to a serial number and to a denomination of the bank note, a memory module (22) in which such captured data (34) is stored, a communication module (24) for transferring the captured data (34) to a designated location, and a component (26) for then rendering each genuine bank note (30) non-usable.

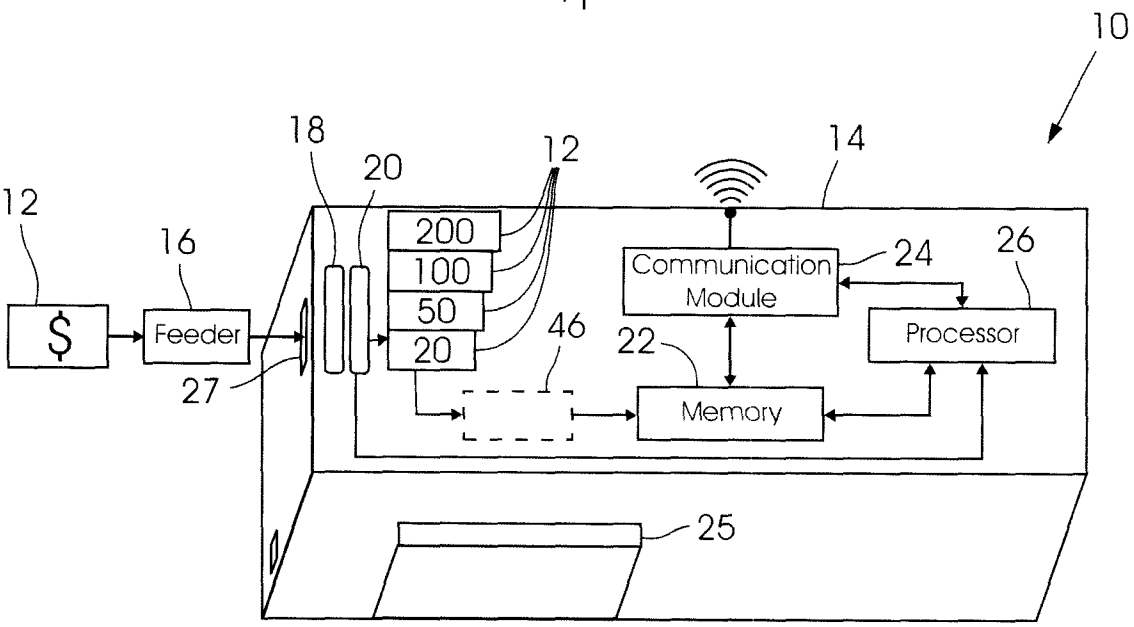

FIGURE 1

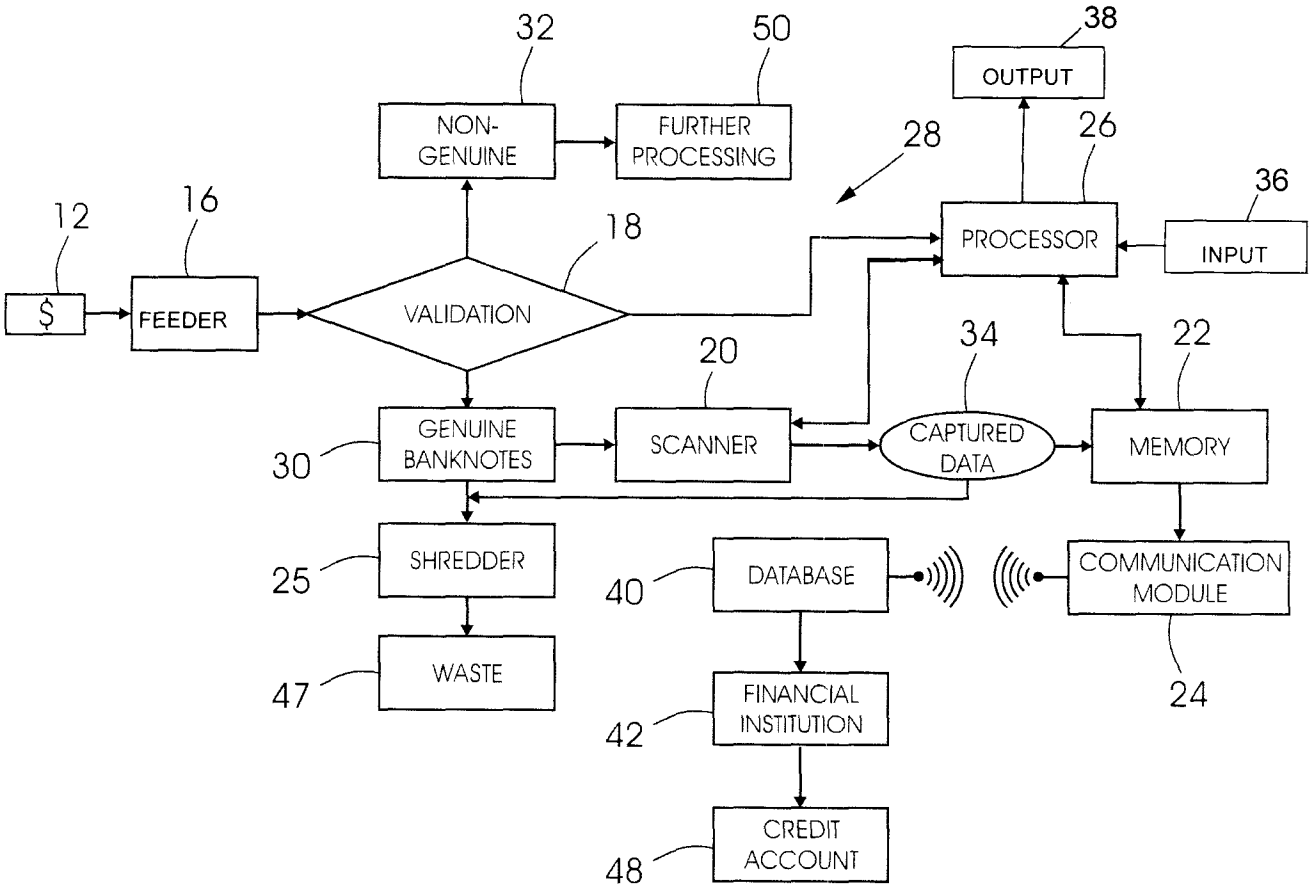

FIGURE 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/ZA2020/050002

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07D11/00 G07D7/00 G07D11/24 G07D11/30 G07D11/32
ADD.

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)
G07D

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/304153 A1 (JOHNSSON YNGVE [SE]) 9 October 2014 (2014-10-09) abstract paragraphs [0021] - [0043] figures 1,3 -----	1-17
X	WO 98/03942 A1 (JOHNSSON YNGVE [SE]) 29 January 1998 (1998-01-29) page 2, line 21 - page 9, line 30 figures 1-4 -----	1-17

☐ 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	Date of mailing of the international search report
10 March 2020	20/03/2020

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bauer, Sebastian

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ZA2020/050002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014304153 A1	09-10-2014	EP 2777028 A2	17-09-2014
		SE 1100839 A1	11-05-2013
		US 2014304153 A1	09-10-2014
		WO 2013070135 A2	16-05-2013
WO 9803942 A1	29-01-1998	AU 3714797 A	10-02-1998
		EP 1064625 A1	03-01-2001
		US 6321894 B1	27-11-2001
		WO 9803942 A1	29-01-1998