**Appendix**

**Table A1. the classification of patents (detailed description of each IPC can be found at** [**https://www.wipo.int/classifications/ipc/en/**](https://www.wipo.int/classifications/ipc/en/)**).**

|  |  |
| --- | --- |
| **Technology sub-systems** | **IPC code** |
| water demand | A01B, A01C, A01D, A01G, A01K, A01M, A01N, A22B, A22C, A23B, A23K, A23N, A43B, A45B, A45C, A45F, A47C, A47K, A61H, A61K, A62B, A62C, A63B, A63C, A63F, A63G, A63H, A63J, B03B, B03C, B03D, B04B, B04C, B05B, B07B, B23B, B23K, B23P, B24B, B24C, B25B, B27K, B28C, B44C, B60B, B60F, B60G, B60J, B60L, B60M, B60P, B60R, B60S, B60V, B60W, B61B, B61L, B62B, B62D, B63B, B63C, B63G, B63H, B63J, B64B, B65B, B65G, B66C, B66D, B66F, B67D, C04B, C05F, C05G, C08G, C09K, C10G, C10J, C10L, C10M, C12Q, C22B, C25B, C25C, D02G, D03D, D04B, D06B, D06F, D06M, D06P, E03D, E05F, E06B, E06C, E21C, E21D, F01B, F01D, F01K, F01P, F02B, F02C, F02G, F02M, F02N, F03B, F03C, F03D, F03G, F04B, F04C, F04F, F16B, F16C, F16D, F16H, F16K, F16N, F17C, F21K, F21L, F21S, F21V, F24D, F24F, F24H, F24T, F25B, F25C, F25D, F26B, F28B, F28C, F28D, F28F, F28G, F42B, F42D, G02B, G06M, G08G, G09F, G21C, G21D, H01B, H01L, H01M, H01Q, H01R, H02K, H02N, H02P, H02S, H04B, H05B |
| water supply | A23L, A47J, A61C, A61G, A61L, A62D, B01D, B01F, B01J, B01L, B02C, B06B, B08B, B09B, B09C, B21F, B25H, B25J, B28B, B28D, B29B, B29C, B30B, B32B, B64C, B64D, B65D, B65F, B65H, B66B, C01B, C01C, C01D, C01F, C01G, C02F, C03B, C03C, C07C, C07D, C07F, C08F, C08J, C08L, C09D, C10B, C10C, C11D, C12F, C12M, C12N, C12P, C14C, C22C, C23C, C23F, C23G, C25D, C30B, D04H, D07B, E01C, E01D, E01F, E01H, E02C, E02D, E02F, E03B, E03C, E03F, E04B, E04C, E04D, E04F, E04G, E04H, E21B, E21F, F04D, F15B, F16F, F16L, F16M, F17D, F22D, F23G, F23J, F24S, F24V, F27D |
| water management | E02B, F15C, F15D, F22B, G01B, G01C, G01D, G01F, G01G, G01H, G01J, G01K, G01L, G01M, G01N, G01P, G01R, G01S, G01T, G01V, G01W, G05B, G05D, G06F, G06G, G06K, G06N, G06Q, G06T, G07C, G08B, G08C, G09B, G10L, G16C, G16Z, G21F, H01F, H01H, H01T, H02B, H02G, H02J, H03B, H03F, H03K, H04H, H04L, H04M, H04N, H04Q, H04W, H05F, H05K |
| **IPC classifications** |  |
| A: Human Necessities | |
| B: Performing operations; Transporting separating; Mixing | |
| C: Chemistry; Metallurgy | |
| D: Textiles; Paper |  |
| E: Fixed constructions | |
| F: Mechanical engineering; Lighting; Heating; Weapons; Blasting | |
| G: Physics | |
| H: Electricity | |

**Table A2. the patents which are not shown in Figure 3a.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Country** | **Total** | **water demand** | **water supply** | **water management** |
| CZECHOSLOVAKIA (CS) | 10 | 3 | 4 | 3 |
| Eurasian Patent Office (EA) | 5 | 1 | 1 | 3 |
| European Patent Office (EP) | 232 | 110 | 54 | 67 |
| Soviet Union (SU) | 169 | 49 | 16 | 104 |
| World Intellectual Property Organization (WO) | 726 | 314 | 220 | 189 |

**Table A3. the full name of country which showed in Figure 3b.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Country** | **Code** | **Country** |
| AR | Argentina | JP | Japan |
| AU | Australia | KR | Korea |
| BG | Bulgaria | KZ | Kazakstan |
| BR | Brazil | LT | Lithuania |
| CA | Canada | LV | Latvia |
| CN | China | MX | Mexico |
| CZ | Czech Republic | MY | Malaysia |
| DE | Germany | NL | Netherlands |
| DK | Denmark | NZ | New Zealand |
| EE | Estonia | PH | Philippines |
| EG | Egypt | PL | Poland |
| ES | Spain | PT | Portugal |
| FI | Finland | RO | Romania |
| FR | France | RS | Serbia |
| GB | United Kingdom | RU | Russian Federation |
| GE | Georgia | SE | Sweden |
| GR | Greece | SG | Singapore |
| ID | Indonesia | SK | Slovakia |
| IL | Israel | TH | Thailand |
| IN | India | TN | Tunisia |
| IT | Italy | US | United States of America |
| JO | Jordan | ZA | South Africa |