PATENTABILITY SEARCH FOR MOTHER AND NEWBORN MATCHING DETECTION ALGORITHM

CASE STUDY

INTRODUCTION TO THE PATENT IN QUESTION

▶ The patent under scrutiny claimed a mother and newborn matching algorithm that involves the organization of discrete matching fields such as name, address, zip code, etc. Weight scores were assigned for exact, partial, or fuzzy matching of personal data between mother and newborn. Weight scores were penalized when there was no matching of fields between mother and newborn. The summation of matched weight scores (i.e., personal information of mother and newborn were matched) and unmatched weight scores (i.e., personal information of mother and newborn were not matched) to provide an overall score. A quality assessment check compared the overall weight score with the threshold score.

▶ Our objective was to assess the novelty by identifying prior art that either directly disclosed or suggested these features through a combination of references, thereby challenging its novelty and non-obviousness.

THE CHALLENGE:
PROVING LACK OF NOVELTY

The novelty hinged on five key features:

▶ A mother and a newborn matching algorithm that involves the organization of discrete matching fields such as name, address, etc.

▶ Weight scores were assigned for exact, partial, or fuzzy matching of personal data between mother and newborn.

▶ The summation of matched weight scores (i.e., personal information of mother and newborn were matched) and unmatched weight scores (i.e., personal information of mother and newborn were not matched) to provide an overall score.

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▶ A quality assessment check was done by comparing the overall weight score with the threshold score.

To assess the novelty, we needed to demonstrate that these features were either already disclosed in prior art or could be derived from a combination of existing technologies.

INITIAL SEARCH STRATEGY

Initial searches using keywords like "mother", "newborn", "personal data", and "machine learning" yielded limited results. Most patents focused on electronic health records of patients, mothers, and newborns. However, the search hinted at potential prior art in US patents and non-patent literature that could be combined to challenge novelty.

CHALLENGES

▶ Electronic health records of patients were matched, but it was not shown that matching was done by any algorithm such as machine learning or artificial intelligence, etc.

▶ Personal information of the mother and newborn was shown, but it doesn't show that their personal information was matched by the machine learning algorithm.

▶ The major features, such as the personal information of the mother and newborn, were matched by an algorithm not explicitly disclosed in patents and non-patent literature.

REFINED SEARCH STRATEGY

After being unable to get better results after our initial search, we decided to brainstorm with our team regarding our logic and ideology to get better results. We refined the search with the following steps:

▶ **Expanded Terminology:** Broadened terms to include "algorithm," "patient," "match," "health records" and "weight scores" to capture alternative phrasing.

▶**IPC/CPC Code Integration:** Prioritized codes like G06N20/00 (machine learning), G16H10/00 (patient-related medical or healthcare data), and G16H50/70 (mining of medical data) to target technical specifics.

▶**Combining Keywords and Classes:** Used terms like "artificial intelligence," "mother," "newborn", "match" and "personal information" alongside classification codes like G06N20/00 (machine learning), G16H10/00 (patient-related medical or healthcare data).

▶ **Global Prior Art:** Included patents and applications from Japan, South Korea, and China to uncover region-specific innovations.

▶ **Assignee Analysis:** Focused on patents filed by leading battery manufacturers (e.g. cognitive care, Agilent technologies, and bayer's healthcare, etc.) to identify advanced algorithms for matching information between mother and newborn.

BREAKTHROUGH FINDINGS

The refined search uncovered critical prior art that, when combined, disclosed all features of the invention:

Prior Art 1:

A US patent describes a matching of electronic health records of two persons by a machine learning algorithm, and weight scores were assigned according to the matching of scores and non-matching of scores.

Person	Height	Weight	Blood Level
R1	3	4	5

Person	Height	Weight	Blood Level
R2	3	6	8

Person	Height	Weight (Unmatch)	Blood Level (Unmatch)
R1 & R2	6	-2	-3

Prior Art 2:

Non-patent literature describes the personal information, i.e., electronic health records of mother and newborn were matched by algorithm. However, it does not disclose the summation of weight scores to match information about the mother and newborn.

Linkage Variable	HES Field Name	Match Weight Agreement	Dis-Agreement
Sex	Sexbaby	0.95	-3.99
GP Practice Code	gpprac	11.68	-3.07
Maternal Age	matage	4.38	-7.40
Birthweight	birweit	8.18	-8.00
Gestational Age*	bestat*	2.80	-1.74
Birth Order	Birordr	0.04	-7.29
Estimated Delivery Date	dobbaby+	8.48	-10.68

Prior Art 3:

A US patent application reference discloses the personal information of two patients was matched by artificial intelligence, and the sum of weight scores are matched to get an overall score, which is compared with a threshold score.

OUTCOME AND IMPACT

▶ **Novelty**: References themselves and also the combination of references demonstrated that machine learning algorithms for matching the information of mother and newborn were not novel.

▶ **Inventor Credibility**: The inventor's prior work established that an algorithm for matching the personal information of the mother and newborn was an obvious extension of existing solutions, weakening the patent's "non-obviousness" argument.

CONCLUSION

This case demonstrates the power of a multifaceted patent search strategy in challenging the novelty of a patent. By integrating inventor analysis, global prior art, and technical expertise, we revealed that an algorithm for matching the personal information of mothers and newborns was not novel but rather an obvious extension/combination of existing technologies. Such efforts ensure that patents genuinely advance innovation rather than stifle competition, fostering a dynamic and competitive technological landscape.

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